THE MONADOLOGY OF LEIBNIZ

THE PHILOSOPHICAL WORKS OF DR. WILDON CARR

HENRI BERGSON, 1911. *Revised Edition* 1919
T. C. and E. C. Jack and T. Nelson & Sons

THE PROBLEM OF TRUTH, 1912 (*out of print*)
T. C. and E. C. Jack and T. Nelson & Sons

THE PHILOSOPHY OF CHANGE, 1914
Macmillan & Co.

THE PHILOSOPHY OF BENEDETTO CROCE, 1917
New Impression 1927
Macmillan & Co.

THE PRINCIPLE OF RELATIVITY, 1920. *Revised edition* 1922.
Macmillan & Co.

A THEORY OF MONADS, 1922
Macmillan & Co.

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Macmillan & Co.

CHANGING BACKGROUNDS IN RELIGION AND ETHICS, 1927
Macmillan & Co.

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Macmillan & Co.

THE FREEWILL PROBLEM, 1928
Ernest Benn Ltd.

LEIBNIZ: "LEADERS OF PHILOSOPHY", 1929
Ernest Benn Ltd.

COGITANS COGITATA, 1930
The Favil Press

THE MONADOLOGY OF LEIBNIZ, 1930
The Favil Press

TRANSLATIONS

MIND-ENERGY by HENRI BERGSON, 1920
Macmillan & Co.

THE THEORY OF MIND AS PURE ACT
by GIOVANNI GENTILE, 1922
Macmillan & Co.

Uniform with this volume

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TREATISE ON THE SENSATIONS

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With a preface by

PROFESSOR H. WILDON CARR

From an engraving by B. Holl

LEIBNIZ

GOTTFRIED WILHELM LEIBNIZ

THE MONADOLOGY OF LEIBNIZ

with an Introduction,

Commentary & Supplementary Essays

by

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THE FAVIL PRESS
CHURCH STREET, KENSINGTON, LONDON
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Contents

PREFACE ix

I. INTRODUCTION

THE STORY OF THE MONADOLOGY 3

THE RELATION OF THE MONADOLOGY TO THE THEODICY 5

BAYLE'S DICTIONARY AND THE ARTICLE "RORARIUS" 9

THE METAPHYSICAL PROBLEM OF THE MONADOLOGY 15

A GENERAL SUMMARY OF THE THEORY OF MONADS 18

II. THE MONADOLOGY 27

III. LEIBNIZ'S ELUCIDATIONS

THE ORIGIN OF THE THEORY OF MONADS 145

AN ELUCIDATION CONCERNING THE MONADS 148

ELUCIDATIONS OF THE REFORM OF THE ONTOLOGICAL ARGUMENT; THE DEFINITION OF MATTER; THE THEORY OF THE PRE-ESTABLISHED HARMONY; THE NATURE OF FREEWILL 153

IV. SUPPLEMENTARY ESSAYS

WHAT IS LIVING AND WHAT IS DEAD IN LEIBNIZ'S MONADOLOGY 171

THE IDEALISM OF THE MONADOLOGY 185

LEIBNIZ AND SPINOZA 205

INDEX 213

PREFACE

The Monadology of Leibniz in an English form has long been available and familiar to students of philosophy in the excellent translations of Professor R. Latta and Professor G. M. Duncan. There is no difficulty in understanding it so far as the diction is concerned; it is the thought which is difficult. It requires interpreting, not only in relation to the scientific concepts of an age when mathematics and mechanics were highly advanced, and physics, chemistry and biology still in their infancy, if indeed they could be said to have come to birth, but also in relation to contemporary science and philosophy.

The Monadology is pure metaphysics. It belongs not to any particular time but to all time. Yet it enjoys a peculiar privilege in the history and development of modern philosophy by reason of the profound influence it has had in determining the direction of later thought, notably that of Kant and Hegel, and it cannot be neglected by anyone who is seeking to participate in the philosophical thinking of the present time.

The theory of Monads is only a small part of the intellectual work of Leibniz. For an account of his whole life and philosophy I may refer the reader to my *Leibniz* (Ernest Benn, London; Little Brown, Boston; 1929).

The Monadology was not written for publication. Leibniz, when he wrote it, had published only one work of philosophy in book form, *La Théodicée*, and the references in the Monadology are almost exclusively to this work.

I

INTRODUCTION

I

THE STORY OF THE MONADOLOGY

The work of Leibniz which we name the *Monadology* is a short treatise in French found among his papers without any title. It was written in 1714 about two years before his death. It purports to set forth in ninety short and carefully connected paragraphs a complete and succinct account of the philosophy which he was accustomed to describe as his "system." Another similar work, also found among his papers, bearing the title *Principes de la Nature et de la Grace fondés en raison*, consisting of eighteen paragraphs, is written with the same purpose of summarizing the philosophy. It seems probable that this was an earlier attempt, set aside as unsatisfactory, and afterwards worked up into *La Monadologie*. We know from the correspondence that Prince Eugene of Savoy, a student and admirer of the philosopher, having read Leibniz's *La Théodicée*, published in 1710, requested him to write a condensed statement of his philosophical principles, and Leibniz did so and sent it to the Prince. There is some doubt which of the two, the *Monadology* or the *Principles of Nature and Grace*

was forwarded to Prince Eugene, but the probability is greatly in favour of the former, if only because it is the more complete.

A German translation of the Monadology was published in 1720, and a Latin translation of this German translation was included by Dutens in his collected edition of *Leibnitii Opera* in 1768, under the title *Principia philosophiæ, seu Theses in gratiam Principis Eugenii.* The original French work was first published in Erdmann's edition of Leibniz's Philosophical works, in 1840.

II

THE RELATION OF THE MONADOLOGY TO THE THEODICY

The monadology is a purely metaphysical treatise in the special meaning which Leibniz attaches to the term metaphysics, namely, a science of pure reason. In Leibniz's view there is a faculty of pure reason (*raison pure et nue*) and by it we are enabled to know reality as it is in itself, reality independent of sensible experience and independent therefore of the religious belief or faith which depends on the evidence of sensible experience, such as miracles, the fulfilment of prophecy, and, generally, what goes by the name of Christian evidence. The principle which guides and supports this pure reason is the logical law of non-contradiction, and the truth it attains is necessary truth, the denial of which involves absurdity. In sensible experience on the other hand we are always dealing with contingent truth. Any fact of experience may be affirmed or denied without involving self-contradiction. The principle which guides experience in the search for truth is the law of sufficient reason. The Monadology is designed to give form and content to a science of pure reason.

Leibniz was a great controversialist. Controversy was a necessity of the age in which he lived, for the

dominant intellectual interest was theology, and theologians were grouped into opposite camps. Of his two great philosophical works, the one, published in his life time, *La Théodicée*, was mainly taken up with controverting Pierre Bayle, the famous author of the *Historical and Critical Dictionary*, and the other, *Nouveaux Essais*, not published till 1765, fifty years after his death, was a criticism of Locke's *Essay on the Understanding*. Yet in these, as in his early correspondence with Arnauld and his later correspondence with Clarke, he has always the ideal of a science beyond controversy, of a possibility of stating eternal truth in unambiguous words, the meanings of which once understood must command universal assent. The Monadology is the attempt to realize such a science.

The full title of *La Théodicée* is *Essais de Théodicée, sur la Bonté de Dieu, la Liberté de l'Homme, et l'Origine du Mal.* To the uninitiated reader it might appear to be an ordinary attempt to reconcile the familiar difficulties involved in the Christian conception of God and the world, and the doctrine of man's fall and redemption. Had we not possessed the Monadology it is probable that, with the passing of the old form of theological controversy and the advent of the scientific interest, the Theodicy would have fallen into complete oblivion. The Monad-

ology enables us to see that it is only in outward form that the argument is theological and that its real strength lies in its appeal to a purely rational conception, which is as pertinent to the modern scientific aspect of the universe as it was to the pre-scientific animistic aspect.

Leibniz argues with conviction and confidence that every apparent discrepancy between reason and revelation, or, as it presented itself to philosophers in the seventeenth century, between the principles of Nature and the principles of Grace, is capable of a rational interpretation. In his view there is a perfect conformity of reason with the things which concern the faith. In this Leibniz stands alone. The *modus vivendi* which philosophers in his time almost universally proposed and followed was a separation of the two realms, and theologians also met the difficulties of logical and experimental science by appealing from reason to faith. " Nay but, O Man, who art thou that repliest against God? Shall the thing formed say unto him that formed it, ' Why hast thou made me thus? ' " The Christian religion was the revelation of a mystery. To rationalize it was impious intrusion. Bayle, for example, who is the chief controversialist quoted at length in *la Théodicée*, found it impossible to reconcile the omnipotence of God with the liberty of man, and the omniscience and goodness

of God with the existence of evil (imperfection, pain, and sin) yet he was not on that account disposed to lower the claims of reason on the one hand, or exalt the virtues of faith on the other. He found refuge as did most others in the reflexion on the disparity between the infinite and the finite. God's ways are not our ways. It is impossible we should see things from God's standpoint. Were it possible so to view reality it is certain all difficulties would disappear. This insidious form of scepticism was the one which Leibniz strove perseveringly to expose and to meet. Man, however handicapped by his finitude and by his vicissitude, is a rational creature. In possessing reason he possesses the absolute, for reason is one and the same, whether it is exercised by God or by the meanest of created things. Reason in the creature may be clouded or obscured, but in itself, *pure et nue*, it is eternal and absolute.

III

BAYLE'S DICTIONARY AND THE ARTICLE RORARIUS

Pierre Bayle (1647-1706) is known chiefly as the author of the Dictionary which bears his name. In many striking respects he resembles Leibniz. Both writers were adherents of the reformed religion, and both were especially interested in and deeply concerned with the particular points at issue between the Catholic Church and the Reformers, and keenly anxious to discover a *via media* which might effect a reconciliation. Bayle was the son of a minister of the Reformed Church and to the distress of his family had been converted in his student days to Catholicism. The conversion had endured however only seventeen months and he had then returned to the communion of the Reformed Church. He was particularly obnoxious to the Catholics on this account. In 1675 he was appointed Professor of Philosophy in the Protestant Academy of Sedan, but in 1681 the Academy was suppressed by Louis XIV, and he avoided prosecution by removing to Holland, where later he accepted an appointment as Professor in the University of Rotterdam. His *Historical and Critical Dictionary* is not a dictionary in the

ordinary meaning of the term. It is a dictionary only in form. It consists of articles on celebrated men of all ages in alphabetical order, but to all intents and purposes the articles are merely a convenience of the author, enabling him to express his own opinions under the guise of criticizing those of his contemporaries. According to one of his eulogists he knew quite well that he was not a philosopher of the first rank, who could impress his readers by the novelty and originality of his doctrine, and therefore he devised this unusual mode of expression to compel attention and secure an audience. Voltaire has described him in his caustic manner : " *Dialecticien admirable plus que profond philosophe il ne savait presque rien en physique. Il ignorait les découvertes du grand Newton, et presque tous ses articles philosophiques supposent ou combattent un Cartésianisme qui ne subsiste plus.*" Voltaire in this shows his own prejudice for at the time Bayle was writing Cartesianism was the prevalent philosophy, the only philosophy then generally recognized as modern in contrast with scholasticism. Bayle wittily compared himself to Homer's cloud-compelling Zeus. " My talent " he said " lies in formulating doubts, but they are only doubts." His works are voluminous and are all controversial. The Dictionary, which was successful and celebrated, was first published in 1696 and an enlarged

edition followed in 1702. Several complete editions were published after his death.

Bayle's article " Rorarius ", which is referred to and replied to in the Monadology, derives its whole interest from its application to the doctrine of Leibniz. The account of Rorarius is short but the notes appended to it fill twelve columns of the large folio and the notes themselves are abundantly annotated. Jerome Rorarius, a native of Pordenone, in Italy, was a papal nuncio at the Hungarian Court in the sixteenth century. He was the author of a book which propounded the opinion that the brutes have a rational soul and even make better use of reason than does man. In support of this the book describes in detail a number of curious facts which illustrate the industry of brutes in comparison with the malice of man. These facts are embarrassing, Bayle tells us, alike to the Cartesians and to the Aristotelians, the two opposing factions. The Cartesians deny that brutes have a soul, the Aristotelians hold that although the brutes have feelings, memory and passions, yet they are not endowed with reason. The difficulty in the view that brutes have only a sensitive soul is the difficulty of setting limits to sensibility and furnishing a specific difference between it and rationality in the soul of man. This affords the ground for discussing, under the article, the views

of Leibniz, to whom he refers as one of the greatest minds of Europe. While Leibniz has offered, it is said, the best refutation of Descartes's denial of the animal soul, he has not succeeded in clearing up the obscurities which surround the ordinary opinion. The main difficulty in the question which divided so sharply the philosophers of the seventeenth century, whether there was or was not a soul in brutes, lay in the consequences which followed from taking up either position. It was agreed by all that the soul is a substance distinct from the body. It would seem to follow therefore that if brutes have a soul, souls can be born and die. It seemed to Leibniz that a new possibility was opened by the scientific discoveries of Swammerdam, Malpighi, and others, which moreover confirmed his metaphysical theory according to which matter cannot constitute a real unity. The new view which the microscope seemed to be confirming was that animals exist already organized in the germ. This was the famous preformation theory now long abandoned. It enabled Leibniz to put forward the theory that every animal is united to a form which is a simple, indivisible, unique being. This form never quits its subject and in nature therefore there is in the strict meaning neither birth nor death. The creation of the world by God was complete from the beginning in the meaning

that all forms of future activity were in existence from the first, inseparably united to the organized bodies which constituted the first generation. The successive generations of organized bodies did not therefore imply new or continuous creation but only the development of what existed from the first. The theory could easily undergo modernization into biological terms but for Leibniz it was purely metaphysical and based on metaphysical reasoning. There is no need, Leibniz argues, to postulate an act of creation for the individual organized body which is born at a particular moment and dies at a particular moment. It is not at its conception that the individual is created, it was created when the world came into existence and it has subsisted throughout inseparably united as form to the body which it will actualize. While, therefore, there may be continual metamorphosis, as when the identical individual passes through the stages of germ, fœtus, maturity, or as when the same creature changes from a caterpillar to a butterfly, there is no metempsychosis, no separating of the form from its organized body in order to pass to another organized body. The voluminous notes and annotations of notes deal with much curious matter. Leibniz's theory was concerned with all these varied speculations, but it cut away the main difficulties at their source by reason of his metaphysical doctrine of substance. All

substance is soul substance ; all existence is individual existence ; every soul is united to its body, not as one kind of substance to another but as form to matter.

IV

THE METAPHYSICAL PROBLEM OF THE MONADOLOGY

It was possible in the seventeenth century to be indifferent to religion and open-minded in theology. It was possible to be a rationalist in regard to the mysteries of life and death, to be unresponsive to hopes and fears concerning the unseen world, and to be impassive and critical towards the popular realistic representations of heaven and hell. It was impossible, however, for any philosopher to take an untheological, or as we should describe it today in positive terms, a naturalistic or scientific view of man's nature and origin. Our modern scientific aspect of nature is the outcome of a long historical and intellectual development. It was as clear to Leibniz and his contemporaries as it is to us today that the matter of our body is continuous with the inert matter of the universe, and that the form which the vital functioning of our organism assumes, repeats a type of general functioning common to all species of living creatures. Yet it was impossible for them to conceive that the human mind, with its rational individualized activities, could have come into

existence otherwise than by a special creation, or at least by an emanation which is a form of creation. Creation implied a creator endowed with sufficient knowledge and power. We have to take into account therefore, that in interpreting man and nature, the presence of reason and the faculty of discourse appeared to raise man above mere animality and admit him to communion with the universal spirit ; and man's knowledge of good and evil was direct evidence of a state of innocence which man had enjoyed and from which he had fallen. If to the vulgar the theory of man's special creation, his original innocence, and his fall, were expressed in myth and legend, to the philosophers they were rational doctrines. The Christian belief—the incarnation, the atonement, the means of grace and hope of glory —came under a different category. This was faith and not reason. It was based on historical evidence, guaranteed by authority and continuous tradition.

The imagery of the Monadology is theological, but its problem is metaphysical in the precise meaning of the term. It is the problem of the conception of the reality which is the subject matter of the science of physics. At every moment of active conscious perception there is present to the mind and ideally represented in it an external and independent reality with a

definite order. In this active perception of the mind the universe is reflected in consciousness as in a mirror. What is this external reality and what is the sufficient reason of its representation? It is not a new problem though it has received in modern times a new orientation. It is the same problem which presented itself to the ancient world when its philosophers inquired: How are the many one? It is the problem which Thales of Miletus, and the other speculating Nature-philosophers of Ionia, sought to solve by searching for a primordial substance-form to which all existence could be reduced. It is the problem which Leucippus, Democritus and Epicurus thought they had solved in the theory of atoms and void. It has assumed a modern form by reason of the discovery of Copernicus, the experimental method of Galileo, and the philosophical principles of Descartes. In Leibniz the key to the solution is sought in the principle of individuality. In the Monadology this principle is made the basis of a complete metaphysics of the physical world.

V

A GENERAL SUMMARY OF THE THEORY OF MONADS

There are two logical principles which underlie all reasoning. These are the principle of non-contradiction which we employ in the search for mathematical and metaphysical truths and the principle of sufficient reason which we employ in all truths concerning matters of fact.

We perceive the universe of objects but we do not perceive the units of which the universe is composed. Yet we know that units must exist because the universe we perceive, and the objects we perceive as belonging to it, are composites, and if there are composites there must be units. These units are the monads, they may be defined as simple substances.

The monads are not material atoms, for atoms are outside one another and so must have parts by which they adjoin one another. The monads are absolutely without parts. A monad has no extension, no shape, no position, no movement. The monads are distinguished from one another by the quality or character which differentiates each from every other.

The assemblage or aggregate of the monads is the real universe. This universe has neither extension, nor shape, nor position, nor movement, and it is not what we perceive. The universe which we perceive and the bodies which we distinguish in it have extension, shape, position and movement. They are not realities at all but only phenomena or appearances, like colours and sounds. The material world is a *phenomenon bene fundatum*, such as the rainbow or the thunderstorm.

We do not perceive things as they are but only as they appear. Their appearances are due to the imperfect way in which we perceive them. Extension is only a phenomenon, it is the representation of things as outside one another. Space and time are not real things nor even perceived phenomena. Space is the order of coexistences in our perceptions, time the order of successions.

Though we cannot perceive the monads as they really are but only in their appearances yet we can know what a monad is for we have the notion of it in our knowledge of our own soul. We have only therefore to imagine that in every monad there exists something analogous to feeling and to what in general we give the name of perception. This gives us a positive knowledge of the monad. The monad we can say will experience change when it has different perceptions.

We are able to conceive the principle of a monad's perceptions. It must depend on a change or alteration which takes place within the monad. As the monad is simple, that is without parts, nothing can go out of it to act outside and nothing can enter into it to make it change internally. Consequently the changes which happen to monads cannot have as their principle something which is outside them. Monads do not interact as the atoms were supposed to do.

This means that the substance of a monad must be conceived as *force*. There is more in each monad than its actuality for there is the possibility of change. There is in each monad a force which is the principle of all the changes which happen to it, or of all the perceptions it experiences, and so we can define substance as that which has in itself the principles of its changes.

The notion of force is metaphysical in its origin but perfectly intelligible. It is what everyone experiences and can observe in himself as effort when he wills to act.

The force of the monads, their effort, the continual tendency in them to produce a new perception is appetition. The state of every monad is continual change, the experiencing of new perceptions without cessation.

The bond existing between the monads which unites them into a universe is not a real but an ideal

bond. It consists in the fact that they all combine together in striving for a common end as though there were real interaction between them. Out of these ideal relations arises a harmony. The bond is of the nature of a harmony.

We have an example of such a harmony in experience. The soul which is the dominant monad of our body has a succession of different perceptions independently of the body, which is constituted of other monads. Yet this body changes its state continually without receiving any influence from the soul and purely as the effect of its mechanism. Between the two there is a harmony such that changes of the body correspond with the changes of the soul.

The cause of this harmony is God who has pre-established it, not by determining the changes of the others, but by considering what must happen to each possible monad by reason of its own force and by actualizing those in which agreement was found.

What we call whole and part and composite are not such in reality. They are phenomena which result from the pre-established harmony, precisely in the way in which in a musical performance the sounds propagated exist independently with no bond uniting them although in relation to our sense-organ they are united in a harmony.

A body is an aggregate of monads, which by the order they preserve among themselves produce the phenomena of extension, mobility, impenetrability, motive force and inertial force.

Each state of a monad expresses and represents the relations between it and the rest of the monads. These states are the monad's perceptions and each perception is representative. As there is no limit to the representation, every perception represents in its way the actual state of the universe, and as every state has its position in a succession, the one perception represents past, present and future. Each monad, however, only represents the universe from its own view-point and in its own manner and not by leaps and bounds. This is why the monad perceives the universe only through the body of which it is the dominant monad. We must think of the universe as an infinity of bodies.

A monad may have no consciousness of its perceptions and what they represent, because its perceptions may be totally obscure. Only when they become clear is there consciousness of them, and consciousness grows with the greater number of clear perceptions. Just as the roar of the surf is composed of individual waves but the sound of the waves may be obscured in the confused roar of the surf.

We never attain to perceptions which are absolutely simple. According to the degree of clearness in their perceptions the monads are graded. When the perceptions are all obscure and confused the monads are *entelechies*, when they have some degree of clearness accompanied by consciousness they are *souls*, when they have knowledge of necessary truths, they are *rational souls*.

An organized body is a body whose constituent monads have among themselves a harmony which makes them concur to a common end in an order in which they appear to depend on one another. Each monad is united to a body by which the universe is represented in it and in respect to which it is a *dominant entelechy*.

There is nothing dead in nature. Everything in it is sentient, animated. Every bit of matter is a world of creatures, souls, entelechies, of an infinity of kinds.

There is neither birth nor death in the absolute meaning. There are only metamorphoses and transformations. Our souls are not created at the moment of conception nor are they destroyed at death. They were created with the world and they become rational when their bodies are developed sufficiently to transmit perceptions with a certain degree of clearness.

II

THE MONADOLOGY

THE MONADOLOGY

1. The Monad, the subject of this discourse, is nothing else than a simple substance which enters into composites. Simple means that it is without parts.

The concept of substance dominates the philosophy of the seventeenth century. The notion of substance arises in the common sense idea that there must be some kind of existence occupying space to which all the variety of the perceptual world is ultimately reducible and out of which in the succession of time it is generated. Early Greek philosophy arose in the quest for the *prima materia* of the world: Is it water, air, fire, or something even more ethereal, such stuff as thoughts are made of?

Substance is the idea of the existence which gives unity and continuity to the world which is the object of experience and to the mind which is the subject of experience. What kind of thing could substance be? The problem shaped itself in varying ways, but two opposite principles, in one aspect contradictory, in another aspect complementary, tended to assert themselves. The first was the idea that substance must, as the substratum of the real, be actual; that it must partake of the character of fact; that as it is self-subsistent and dependent on nothing outside itself, it must be what it is at every moment of existence; it must, by its definition, be changeless; it is what is and cannot not be. The other was the idea that substance is of the nature of force; that its reality must consist in its potentiality at every moment and not in

its actuality at any moment. If we compare the two ideas, we find that each is suggested by the objects of familiar experience. These objects are of two kinds, the inert and the living. The substance of an inert thing seems to be actual and unchangeable ; the substance of a living thing seems to be potential. A living thing is never what it is in its actualization at any moment of its history. It is always becoming. Its reality is its force or power.

The followers of Descartes, including Spinoza, had sought the solution of the problem in terms of actuality. Leibniz abandoned the whole attempt ; took his type of reality from the living world ; regarded the inert, material world as pure phenomenon and conceived substance as force. The reality which gives unity and continuity to the world of experience is not an actuality but a potentiality, not matter but force, not fact but power.

The Monadology opens without a formal definition of substance. It indicates, however, the kind of existent which will alone satisfy the concept of substance. Substance is that which has in itself the principle of its changes. Leibniz begins with the simple logical consequence, that if there are composites there must be components, and the components must be units not further decomposable.

Leibniz, like Spinoza, holds against Descartes that there are not two substances but one only. Unlike Spinoza he holds that this substance exists in an infinite number of separate beings. In every existing substance the essence is one and identical, it consists in effort and perception.

Spinoza and Leibniz stand out pre-eminently in the history of modern philosophy on account of the pre-

cision they have given to their definitions of the fundamental concept of the substance of the universe. Each has based his interpretation of nature and mind on the concept of substance. Spinoza's substance is by definition one, Leibniz's substance is by definition many. Spinoza's substance is identical with the concept of God and named God. Leibniz's substance is simple and named a monad to show that it is primarily and essentially multiple.

The difference is fundamental and affects the two philosophies down to the minutest points of detail. When we compare the two we see that Spinoza's concept is primarily objective and static. In all the variety of its infinite modes the substance of the universe is one and identical. The ground of all existence, natural or ideal, is, according to Spinoza, the one substance, there is no determination of one thing by another thing, no power in one thing to be a cause and produce an effect in another thing ; there is the one substance and its modes. The idea of a transcendent cause is for Spinoza a self-contradiction. Design, purpose, free agency, are appearance, consequent on the limitation implied in the existence of finite modes. Necessity is in nature, not in the power which rules nature.

Leibniz's conception is, on the other hand, subjective not objective, and dynamic not static. No universe exists independently of the monads and the universe common to the monads is the universe of the monads. The activity of the universe is the activity of the monads and these are free spirits expressing themselves.

The essential difference between the two views is not that one is materialistic and the other spiritualistic,

both accept the two aspects of the universe, its aspect as a material extension and mechanical movement, and its aspect as an intellectual system of ideas and volitions. The difference is that while Spinoza finds the unity of these two aspects in an identical substance, and the duality in the concomitance of the two series of the modes of the two attributes of that substance, Leibniz, starting with a real plurality, deduces the aspect of the universe as a single mechanistic system from the nature of the individual activities of the monads.

2. There must be simple substances since there are composites ; because the composite is nothing but a group, or *aggregatum*, of the simples.

Leibniz does not start as Descartes did with *cogito ergo sum*. Such a beginning presents the factual existence of a simple substance, for the self is simple, inextended, individual. Leibniz however appears rather to reverse the formula and say *sum ergo cogito*. Whatever is, is active, and to be active is to think in some form or mode.

" There are composites ", that is to say there is an objective universe presented to the mind and there is a body which mediates the mind's activity. The body is part of and continuous with the universe. The body has parts. The universe is a collection or aggregate of things, its oneness is the unity of a collection and the reality of the collection is its constituent units. What then are these constituent units ? They

are monads. Monads are not perceived objects, they are the reals which are implied in the perception of objects.

The ancient philosophy had propounded the same question and given its answer. It had defined simple substances as atoms. The difficulty of the concept of atoms is that it requires us to postulate a limit to the divisibility of matter, conceived as the content of space, at the same time that we are obliged to admit that there can be no limit to the divisibility of space, conceived as the container of matter. It can be demonstrated that there exists no limit to the divisibility of geometrical space. Space is defined by points and lines and planes and these are themselves undimensional and without magnitude. Yet although space is by definition divisible to infinity, if it be occupied then there must, it was argued, by the very concept of occupancy, be a limit to the divisibility of matter, and atoms therefore are the indivisible units of matter and not mathematical points. In modern philosophy a similar problem arose in regard to events or time occupancy. It led to the concept of a specious present, that is, an indivisible moment of time which is not a mathematical point-instant but an interval which holds something of the past and something of the future in the present now.

Atoms and events are not real units. This does not mean that we cannot discern them perceptually or construct them conceptually. It means that the concept of them is self-contradictory. Space-time occupants are by definition composites and therefore themselves imply units. It is vain to look for real units in space and time for space and time are principles of multiplicity.

Yet we have not to go outside experience to find real units. Our own self-centred perceptive activity, our self as subject of an activity, presents to our reflexion both the fact and the type of simple unity. My existence is self-existence. It depends on nothing external to itself, that is to say, my existence is affirmed in my activity and my activity is identical with my existence. The universe may contain infinite reals of this nature. In fact every object which we conceive as living, acting and conscious, must, if it have these characters, fulfil, from its own subjective standpoint, exactly the conditions of a simple substance. Such an object is not a space-time occupant, whatever part space and time play in its activity. We cannot say of a self that part of it is here and now, part there and then; wherever and whenever it is, it exists altogether as indivisible unity. The spatial and temporal order of the universe is something which the subject of experience perceives or conceives, it does not introduce multiplicity into the subject, or divide and separate the subject of experience into component parts. The subject of experience exists only integrally as simple substance or monad and such monads are the real units which constitute the universe.

3. Where there are no parts, there can be neither extension, nor shape, nor divisibility. Monads are the real atoms of Nature. Briefly, they are the elements of things.

Monads, it will be seen, are what Kant much later will describe as noumena and distinguish from phenomena. They are things in themselves. How

then, can the physical universe, the universe present to me as phenomenon in my sense-experience, be constituted of noumenal monads? The phenomenal universe is composite. Its parts or constituent elements are connected in my apprehension by an order of coexistence which I objectify as space and an order of succession which I objectify as time. The things I apprehend in this order of coexistence and succession, and the space and time which I apprehend as the framework of things and events, seem to exist independently of my activity in perceiving them. In what way can I conceive this independence to be real? It is clear that the presence of phenomena in my perception does not of itself endow phenomena with the status of noumenal reality. Sense-perceived objects are relative through and through. There is only one way of conceiving any object known phenomenally as existing noumenally, and that is to conceive it as a monad, and to conceive it as a monad is to conceive it as in itself an indivisible, integral, active, self-centred subject with its own experience. I habitually endow my fellow men, and to a certain extent all living forms, with this noumenal reality. The phenomenal aspect of these objects is mine and not theirs, the noumenal existence of their experience is theirs and not mine. There is no other way of conceiving things in themselves. If there is a real universe, and if this real universe is composite, if it exists other than as my idea, then monads and not space-occupying atoms are its elements.

4. There is no dissolution of a monad to be feared, for there is no conceivable way by which a simple substance could perish naturally.

The universe of which the monad is a constituent is the physical universe—the universe which is presented in sense perception, conceptualized in thought, and objectified in action. It is the phenomenal universe of common sense and scientific reality, the noumenal reality of which in philosophy we seek to understand. It is the elements of this universe which Leibniz declares to be monads. What does this imply in the nature of the universe ? Since monads are inextended the universe of the monads cannot be in space, and since monads are active the universe of the monads cannot be a succession of inert states in time. The elements of the universe are not therefore a mechanically determined order of coexistent, inert, minimal masses in a mechanically determined order of successive states, such as the atoms purported to be. Now the atoms were conceived primarily for the purpose of finding a basis for the stability of the physical world, for its indestructibility and for the continuity of its materiality. The monads on the other hand seem to offer no such guarantee against dissolution. Leibniz touches here a difficulty which is felt acutely in regard to the modern concept of energy. If mass is a function of velocity, as the modern theory finds it necessary to define it, must we not postulate inert particles in some form ? Otherwise it would seem that the cessation of activity would imply the dissolution of the universe. The monad, however, cannot undergo dissolution. First, it does not consist of parts, and

second it is what it does. The argument of Socrates in Plato's *Phaedo* that the soul does not come into existence nor go out of existence, does not arise and cannot perish, applies exactly to the monad. Where and when the monad exercises its activity depends on an order of coexistences and successions within the universe of monads. There is no independent order imposed from without. The universe of monads has no container. The existence or reality of a monad refers to the activity it actually expresses and not to any when and where conditions of its expression.

Here, however, a serious difficulty confronts us. If space and time are not an absolute and independent framework, can we form the conception of an objective universe in the scientific meaning ? The consistency of the monadology depends on the answer. The doctrine of the monadology is that the universe in its noumenal reality is a congeries or aggregate or consensus of independent activities, which by their harmony coexist, and by their mutual adaptation become interdependent in an organized whole. The perceived universe, what, using a later distinction, we may call the phenomenal world, with its spatio-temporal order, is the sense-intuited aspect of an intelligible reality. Now as matter of fact we do think of the real world in this monadological way, however unconscious we may be in our ordinary experience that we are doing so. It is clear to a moment's reflexion that what we call history is the expression of the actual activities of the historical personages who performed the notable deeds which have been judged worthy of record. And if we pursue this reflexion to its natural consequence we see that the real world itself can only be the full expression of all the un-

recorded activities which compose it. We recognize also that every real activity, however mean and apparently insignificant, however comparatively brief its expression, has, by the very fact that it has exercised its activity, established its inalienable right to be ranked as a simple, indestructible, indissoluble substance, entering into the composite universe as one of its constituent elements. Even God cannot make what has been not to have been. In fact we recognize that there is no conceivable way by which a substance can perish.

5. For the same reason there is no way by which a simple substance could naturally begin to be, since it could not be formed by composition.

This may seem to be merely the converse of the previous affirmation that a simple substance cannot perish by natural means, but in fact it has a peculiar significance of its own. In what it denies, Leibniz may have had in mind Descartes's theory of the generation of individual mechanisms by movement imparted to extension. He is here propounding, however, what to him is a logical consequence of his own concept of individual substance. An individual substance contains its attributes in the same way in which the subject in the logical judgment contains the predicates. For a clear enunciation of this principle the student may be referred to the *Discourse on Metaphysics* and the correspondence with Arnauld. The following quotation is from Section VIII (Montgomery's translation). "Now it is evident

that every true predication has some basis in the nature of things, and even when a proposition is not identical, that is, when the predicate is not expressly contained in the subject, it is still necessary that it be virtually contained in it. Thus the content of the subject must always include that of the predicate in such a way that if one understands perfectly the concept of the subject, he will know that the predicate appertains to it also. This being so, we are able to say that this is the nature of an individual substance or of a complete being, namely, to afford a conception so complete, that the concept shall be sufficient for the understanding of it and for the deduction of all the predicates of which the subject is or may become the subject". What he meant was made clearly evident in the correspondence. If we suppose God to create or bring into existence an individual substance, we have not to suppose that to do so God must create all the attributes of that substance and all the forms of expression which its activity will assume. These are all given *a priori* in the nature of the substance itself. What God creates therefore is a simple substance with its real nature which will itself express itself. In the Monadology Leibniz is solely concerned with the metaphysical concept.

6. Monads can only begin to exist or cease to exist all at once, that is to say they can only begin by creation and end by annihilation. On the other hand what is composite begins or ends by parts.

In this proposition we have the most striking contrast between the monadic theory and the atomic theory,

both in the ancient form of atoms and the void, and in the modern Newtonian form of absolute space, even-flowing time and moving masses. Apart from the logical antinomies involved in the concept, it is clear that for the atomic theory, in whatever form held, creation or annihilation of the physical world can only mean a redisposition of previously existing indestructible material ; on the other hand, the creation of a monad is a new beginning and the ceasing to be of a monad is annihilation. For example, if I take the concept of myself as an individual substance, a subject of experience, active in perceiving and in giving form to my actions, I can conceive myself coming into existence and going out of existence, but only so long as I conceive myself in my individuality as one with my perceptions and actions, not if my perceptions and actions are conceived as detachable from me and existing on their own account. This means that when I cease to exist my perceptions go out of existence, my world perishes with me. It came into being with me and will go out with me.

7. There is no conceivable way in which a monad could be inwardly altered or changed by some other being than itself. We cannot alter anything in it, nor conceive any internal movement in it which can be excited, directed, increased or diminished by us. Such an externally induced change is only possible in composites where the parts interchange among themselves. The monads have no windows by which anything can

> enter in or go out. Accidents are not detachable from substances nor able to walk away on their own account as the *sensible species* of the scholastics were supposed to do. Neither substance nor accident therefore can enter a monad from outside.

The privacy of the monad is inviolable. It cannot be changed or altered in its nature by an external influence brought to bear upon it. Now precisely the same might be said of the atom, but the simplicity of the atom is directly opposite in character to the simplicity of the monad. We cannot change the inner nature of the atom because by definition the atom has no within. We cannot alter or change the inner nature of the monad because by definition it has no without. Atoms are distinguished from one another by position and relative disposition alone, and all their relations are external. In atoms therefore there is nothing to alter. Anything which changes a monad must, on the other hand, be in it, for all its activities are within and self originated.

The often quoted sentence " the monads have no windows " may easily lend itself to ambiguity. " Windows " generally mean transparencies out of which we look and through which light can enter. Leibniz means openings of any kind through which there can be free passage. It is true of the monad that it has no windows, in either meaning of the term, but since the activity of the monad is perceiving, and since perceiving derives its meaning from the faculty of visualization, it may easily be misleading to interpret

the figure in the first sense. Nevertheless it is as true of the monad to say that nothing can look out from it or look into it as to say that nothing can go out of it or come into it, because there is no outside. It will be said however that the monads are certainly outside one another. This is true in the absolute meaning that every monad is self-contained. It is not true if it implies an independent space within which monads are juxtaposed. The universe is mirrored in the perceptions of every monad and there is only one universe—the universe of the monads not a universe in which there are monads.

In the *Discourse on Metaphysics* Leibniz says (xxvi) "Ideas are all stored up within us" and he explains his meaning in this way: Most of us suppose that an idea is the form of what we are thinking about when we think, and that every time we think of the same thing we have another different idea of it, which may be similar to the preceding one. The fact is, however, that our mind possesses the power of representing to itself anything it wishes to think about as the occasion arises, and this activity of our mind in expressing natures, forms, essences, is properly the idea of the thing. The idea therefore is always in us whether we are thinking of it or not. Nothing enters naturally into our minds from outside. We have a bad habit of thinking that our minds receive messengers and have, as it were, doors and windows. All our ideas are always in our minds because at every moment the mind expresses all its future thoughts. It is always thinking confusedly of all that it will ever think distinctly. We cannot learn anything of which we do not already possess the idea. The idea is the material out of which thought will form itself.

The contrast in the section we are considering is between the conceptions of units differing only by their absolute position and relative disposition, and units which are indivisible individuals differing qualitatively and absolutely, not quantitatively. Since the monads are inextended the composite universe cannot be spatial, and since the monads are active the universe cannot be inert. The universe, therefore, does not depend on the fundamental conception of a mechanically determined order of coexistent inert masses and a mechanically determined order of successive states. But if space and time are not postulated as an absolute framework, can we give any definition to our idea of a really objective physical world? The answer is that the difficulty is not in the conception, this is both metaphysically and mathematically presentable to the understanding, the difficulty is in the imagination, for we are precluded the use of sense imagery. Space and time are not abolished but they are subordinated. The perceived universe, the universe mirrored in each monad, will then be the sense-intuited aspect of an intelligible reality. Space and time will belong to this intuited aspect of the universe. Space is then for each monad the order of coexistences of its perceptions, time the order of successions.

It is not possible to imagine the universe without a spatio-temporal setting. Yet we can find abundant illustrations of real activities in which the necessary mental imagery involves a spatio-temporal setting, but in which this mental imagery can be recognized as no more than a supporting scaffold, and space and time themselves not fundamental conditions on which the reality depends. The living body is such a reality.

It is constituted of elements each of which is independently unfolding its own individual activity and all of which in their harmony become interdependent and subservient to the individuality of the whole. A family, a city, a society, a nation, can be exhaustively described in terms of the independent activities of their constituent individual members and of their interdependent harmony. The monadic universe is such a reality.

The " sensible species " of the scholastics, to which Leibniz makes a playful allusion, was the scholastic theory of the origin of what today we refer to as sense-data. It was perhaps the crudest form of the representative theory in the history of philosophy. The real objects were, it was assumed, capable of casting off from themselves ideal or ghostly representatives or copies which had the power to affect the mind and furnish it with sense-imagery.

8. The monads must have qualities, otherwise they would not even be beings. If simple substances were not qualitatively different, there would be no means of being aware of any change in composite things, since what is in the composite can only come from its simple ingredients. Were the monads without qualities they would be indistinguishable from one another since they do not differ in quantity. And then it would be like movement in a plenum, each place would receive only the equivalent of what it parted with and one state of the whole would be indistinguishable from another.

By qualities Leibniz does not mean sensible qualities but the kind of qualities which we ascribe to individual persons when we characterize their actions. The quality of a monad is not the external appearance it may present to the perception of another, but the character of the internal activity which distinguishes its nature from the nature of another. This opposition of numerical to qualitative difference can be illustrated in the conception of an army. We may regard the soldiers of an army as so many fighting units arranged in the field of battle and we may then neglect altogether the quality of the unit soldiers ; or we may conceive each soldier, in his personal activity, ready to respond to the requirements of the action. In this aspect of the units they differ qualitatively. It is not however the actions of the individual which are the quality of the monad, the actions are the direct outcome of the nature of the monad and this nature is its quality. The distinction is very important for on it depended the doctrine of individual freedom and human responsibility. God, in Leibniz's view, in creating the monads created free individuals each with its own distinctive quality, and in doing so he did not decree the actions of each individual although by his omniscience he knew beforehand what actions the free exercise of the nature of the individual monads would actualize. It was this foreknowledge which enabled God in creating the universe of monads to pre-establish its harmony. Challenged by Arnauld that his doctrine implied a fatal necessity, inasmuch as all the individual members of the human family must be considered qualities of the first parent Adam, seeing that Adam's actions follow from his nature, and these actions

involve the existence of his children and children's children indefinitely, and all therefore that happens in the world is contained for God in the one original concept of Adam, Leibniz replied in effect that no monad is the quality of another monad or derives from another its quality or nature. He explained the generations of individuals, and their continuity through ancestry with the first parent, as the pre-established harmony rendered possible in the creation by the perfection in God of the attribute of omniscience.

To appreciate the significance of the concept of the pre-established harmony we have to bear in mind that Leibniz is writing for a philosophical generation which knows not evolution and which views every problem from an intellectualist standpoint.

9. There is another reason why each monad must be different from every other. It is that there are never in nature two beings which are perfectly alike and between which it is not possible to find an inward difference, or one based on an intrinsic character.

This is the logical principle of the identity of indiscernibles. It is the simple principle that if there is no difference between two things they are not two but one and the same. Of course for Leibniz there are no things, there are only monads and their perceptions, all reality therefore is individual. Yet while the principle is based on the concept of reality, Leibniz was prepared to defend it empirically. In the correspondence with Clarke he says: "A friend of mine, in conversation with me one day in the garden

of Herrenhausen in the presence of the Electress said he was sure he could find two leaves exactly alike, the Electress challenged him to produce them and he hurried about searching for them a long time but in vain."

10. Also I take it for granted that every created being is subject to change, and consequently the created monad changes, and indeed in every monad change is continuous.

The concept of change now replaces the concept of movement. This is not the mere choice of another expression, it is the advance to a new idea and it follows from the concept of the monad. Movement in the meaning of a propagation or a translation is inconceivable in the monad, because the monad is not extended nor is it spatially juxtaposed to other monads. Internal movement in the meaning of mechanical rearrangement of parts is equally inconceivable because the monad has no parts, it is simple and indivisible. On the other hand change in the meaning of becoming, of history, of identity in difference, of duration, of the actuality of the past in the present, is essential because the reality of the monad is activity. Change is not a recurring series but development, self-unfolding. The monad changes because the monad lives.

11. It follows that the natural changes of the monads depend on an *inner principle*, because, as we have shewn, an external cause can produce no effect on the inner being of the monad.

Leibniz had said in the *Théodicée* (396) " According to my view every simple substance, and that is every real substance, must be the real immediate cause of all its actions and of its internal passions ; indeed, to speak with metaphysical precision, it has no other actions and passions than those it itself produces." In this passage he is combatting the view that God is not only the cause of the existence of the monads by the creation of the world, but that he is also the immediate cause of their individual actions and passions. He holds on the other hand that the universe consists of real natures and that the actions of the monads are the free expression of their free natures and that the wisdom or omniscience of God, not his power or omnipotence, accounts for the order of the universe.

12. Besides the principle of change there must also be the differentiation of what changes and this is what gives simple substances their specific character and variety.

There is no present state of a monad which can be taken by itself and compared with a past state. The reality of the monad is not static but dynamic. Any specific quality it may have must belong therefore to a process and not to a state ; and any variety it may have must have regard to the activity in its integral unity and depend on a degree in the process of activity. In modern phrase we might say the variety of the monads is a variation of rhythm in their progression.

13. This differentiation means that a manifold is included in the unity, a complexity in the simple. For natural change progresses gradually, which means that something changes and something endures. In the simple substance, therefore, there must be a plurality of modifications and relations even though there are no parts.

This completes Leibniz's definition of the monad. As simple substance it is pure act, as activity it is indivisible and not resolvable into a succession of states. It does not follow that the monad has no manifoldness and no variety, for variety is inherent in the concept of activity.

14. The fleeting state which encloses and represents a manifold in the unity, or in the simple substance, is no other than what we call *perception*. We must however distinguish perception from apperception or consciousness, as will appear later. It is here that the Cartesians have gone wrong. They have supposed that the perceptions we do not apperceive count for nothing and this is why they hold that only minds are monads, and that neither beasts nor other entelechies have souls. In common with ordinary opinion, they have fallen into the confusion of being unable to distinguish prolonged unconsciousness from actual death. This has led them

to adopt the scholastic prejudice that souls may exist in complete separation from bodies, and has even confirmed some ill-balanced minds in the opinion that souls are mortal.

Leibniz, having defined the monad, proceeds to characterize the activity of the monads. The general character of this activity he names perception. In their efforts or perceptions the monads give expression to the whole universe. They are the universe and in their perceptions they express it. The sensible world has no reality outside the perceptions of the monads, and there are as many sensible reproductions of the world as there are monads. Perception is to be taken in a meaning which does not imply consciousness. This perception differs in degree in the various orders of the monads, rising from an almost total confusion and obscurity in the simple monads to a high degree of clearness and distinctness in the conscious monads, and supposing perfection in the completely adequate ideas of the supreme monad, God. Thus there is a hierarchy of the monads the possibility of which lies in the distinction in kind between perception and consciousness. Consciousness is perception but also it is more than perception and more than a degree of perception. It is apperception, the perception of perception, the awareness of the perceiving in the awareness of the perception. If then we follow Leibniz we must use the word perception in another sense to that which it has acquired in philosophy and with a different meaning from that which it bears in psychology. Perception, as Leibniz defines it, is not a psychical activity superimposed on a physical activity ; it is itself

physical in the sense that it is the aspect of activity when we conceive activity not as mechanical movement but as inherent force. An active nature, that is, a substance, which develops activity from an internal principle and is not determined by outward compulsion, must perceive. This does not mean it must be conscious or aware of a reality confronting it, or that it must be self-conscious in the presence of an opposing force, it means that in the concept of a self-developing nature the stage and range of its influence as it develops must be mirrored or reflected in the progressing action. In other words activity must assume two aspects according as we have regard to its source in the nature of the monad, or to its expression in the development of that nature, and the two are correlative. This is what Leibniz means by perception.

The error which Leibniz in this article charges to the Cartesians is due to their failure to distinguish between what we today call life and knowledge. Perception with Leibniz is the character or quality of living activity, and living activity is found where there is no evidence or trace of the presence of reflective consciousness. The two substances of Descartes, thought and extension, separated the activity of consciousness from the movement propagated in an inert extension. The difficulties which surround the modern use of the term " unconscious " depend on the same separation. The " unconscious " of modern psychology is suppressed, inhibited, automatically controlled consciousness ; it is not the unconsciousness of inertia, and it is not the limit or zero of conscious activity, for it is conceived as force or forces which are not even latent. The difficulty of the modern usage is precisely the difficulty of Leibniz's

use of the word perception. Just as the unconscious is not the negation of consciousness but active consciousness in a state of inhibited expression, so perception is identical with apperception in the nature of its activity but apperception is the new quality or higher degree which reaches expression by reflexion of the activity on itself. The Cartesians made a clean cut of this difficulty. For them there was only the opposition between the activity of conscious perception or thought and the inertia of extension. Movement was an externally initiated disturbance of extension, quantitatively constant. The only real activity was thought. This existed in the form of souls or thinking substances, not entelechies. It followed from the Cartesian principle that living creatures are explained by the mechanism of movement, and that in the human being the active soul is existentially distinct from the mechanically disposed extension, the body.

The immortality of the soul was thought by Descartes to be placed on a rational basis by the separation of soul and body, but if the essential attribute of the soul is apperception or consciousness, its immortality must depend on the continuity of this consciousness. Leibniz bases the immortality of the soul on the individuality and indestructibility and impenetrability of the monad.

In the final sentence of this section, Leibniz gives expression to his view that were the dissolution of the union of the soul and the body to be complete and sudden it would imply the mortality or death of the soul equally with that of the body. The ground of this opinion is that as reality consists in activity perfect inactivity would not be a state of natural immortality

but non-being. In this, though he does not refer to it, he may have had in mind the Pauline argument that the spirit when the body dies exchanges a corruptible body for an incorruptible, at any rate to the extent that the idea of soul without body is like the idea of substance without quality or nature, a pure abstraction. Some light on his meaning may be obtained from a passage in the *Nouveaux Essais* (book II., chapter 23, 21). Philalethes representing Locke's doctrine says : " We have only to reflect on the separation of the soul from the body at death in order to be convinced of the soul's movement." Théophile representing Leibniz replies : " The soul might cease to function in this visible body, and if then it should cease to think altogether, as Locke maintains, it could be separated from the body without being united to another body and in this case its separation would be without movement. But for my part I believe that as it always thinks and feels so it is always united to some body, and indeed that it never quits suddenly and completely the body to which it is united".

Appetition is the general term for what in each monad is effort. The monads being forces, their activity is not simple mechanically propagated movement but tendency or effort. It is because each monad receives the impressions of the tendencies or efforts of the other monads that it represents the universe. In a letter to the Electress Sophia in 1706, Leibniz had said: " We know in fact that one and the same body can receive at the same time an infinite number of impressions, each of which has its effect ; and in a mass of tendencies or efforts under pressure the minutest part resists the efforts of all the rest, and this could not happen unless each received the im-

pression of all. This is what makes us conclude that the unities (monads) themselves, from which all the rest results, must be modified in relation to everything which surrounds them, and in fact it constitutes the representation which is attributed to them ".

15. The principle which brings about internal change in the monad itself, or makes it pass from one perception to another, is appetition. Appetition strives toward the completeness of perception and though it may fail to attain it, something is always gained and there is continual advance to new perceptions.

This internal principle of change is not only essential to Leibniz's concept of the monad, but it marks a distinct advance on the Cartesian principle. Perception, abstract and pure, has no duration. For external perception all nature exists at an instant, and according to the Cartesian principle extension only exists in this momentary way. Change, in the Cartesian physics, is the alteration of relative position within extension, due to the movement imparted to it. The continued existence of the universe from moment to moment, and the determination of one moment by the condition existing at the preceding moment, was attributed by Descartes to the direct action of God. Not only for the Cartesians is God the direct cause of the continued existence of the universe, but God is also the occasional cause of the changes in the soul which correspond to the changes in the universe. Leibniz holds on the contrary that the act of creation, the act which brought the world into existence, was a creation of individual

substances, monads, each with its own nature and principle of free development. The perceptions and changes in these substances are caused or occasioned by their own nature. The difficulty in such a conception of the act of creation, namely that the future of such a universe could not be foreseen, was met by an appeal to the divine attribute of omniscience and led to the theory of the pre-established harmony.

16. We ourselves experience multiplicity in a simple substance since the least thought of which we can be conscious embraces a variety in its object. Thus all who acknowledge the soul to be a simple substance must recognize this multiplicity in the monad, and Monsieur Bayle ought not to have found any difficulty in this. (See his Dictionary, article *Rorarius*).

Bayle's criticisms in the voluminous notes on his article on Rorarius, a sixteenth century author of a treatise designed to prove not only that brutes are rational but that they make a better use of reason than man, are directed generally against the theory of the pre-established harmony, and more especially against the particular difficulty of the parallelism between the changes of perceptions in the soul and the succession of actions in the body. Leibniz in an article in the *Journal des Savants*, 1695, in which he compared soul and body to two clocks which though independent in their mechanism are always in complete accord, had said that everything originates in the soul from its own

basis by a perfect *spontaneity* with regard to itself, and yet with a perfect *conformity* to beings outside itself ; that its internal perceptions happen to the soul through its own original representative constitution (that is, it is able to express beings outside itself by their relation to its organs) given to it at its creation as its individual character. Criticizing this doctrine Bayle says : " I can understand how a dog passes immediately from pleasure to pain if while it is satisfying its hunger and devouring food someone strikes it with a stick. What I cannot understand is how it can be so constructed that at the moment when its body is struck its soul must feel pain independently of whether it is struck or not, and even though it should go on eating without disturbance or interruption." Further on and referring now to the human soul, he says: " It would be possible to understand that it should be so were we to suppose that a man's soul is not a mind but a legion of minds, each with its own functions which begin and end precisely as the changes which go on in the human body call for them, but, in this case, man's soul would not be a substance, it would be an *ens per aggregationem*, a mass or heap of substances just as material beings are. What we find the soul to be, however, is a unique being which produces now joy now sorrow ; what we do not find is several beings one of which produces hope, another despair." It is probably to this criticism that Leibniz makes the reply that variety in a simple substance ought to present no difficulty seeing that it is what everyone experiences in his simplest thought.

17. Perception, and all that it means, is not to be explained by *reasons which hold good in mechanics*. We cannot, that is to say, explain perception by figures and movements. Let us imagine a machine capable of thinking, feeling, and perceiving ; let us conceive it magnified, still preserving its proportions, until we can fancy ourselves entering into it as into a mill. On going in we should see the interlocking parts, but we should not see anything which would explain a perception. It is not in the composite, the machine, but in the simple substance that we have to look for perception. In the simple substance the one and only thing which we could find would be perception, that is to say, perceptions and their changes. All *internal actions* of simple substances can only consist in perception.

The force of this distinction is emphasized in modern science in the inability ever to pass from physiology to psychology. We are able by reason of the great advance in neuro-cerebral physiology in recent times to enter the brain, in the very way which Leibniz imagined our entering into the mill. We are able to lay bare the whole mechanism of the brain, to follow its response to stimulation, its influence on the muscles and the control of them, the neural inhibitions and coordinations. We are nonplussed by the factor of perception. Perception is of paramount importance,

we see the utility of its function, yet the machine gives us no clue to its formation or to the nature of its existence. We can see exactly where perception intervenes and it seems as though it must be manufactured when and where it arises, and yet we cannot discover any process of its manufacture, or any kind of mechanical interaction which actually does, or conceivably could, produce it. Leibniz gives us the reason. Perception is the internal activity of a simple substance, or, as we might say, of an individual nature, it is not an effect produced by mechanical contrivances. Descartes is right, we may imagine Leibniz to say, in denying perception to the automatic organism, wrong in failing to see that it is inseparable from the concept of internal activity.

18. Simple substances, or created monads, may all be named Entelechies, because they have in them a certain perfection, (ἔχουσι τὸ ἐντελὲς). They have a self-sufficience (αὐτάρκειαν) which makes each a source of its own internal actions, and we may describe them as incorporeal automata.

Leibniz here invokes the Aristotelian word *entelechy* to indicate that the internal activity of the simple substance is self-originated and self-contained. He refers us for the reason to a section (87) of his *Théodicée*. Aristotle, he there tells us, has given to the soul the generic name of entelechy or act. There are two kinds of act, the permanent and the successive. The permanent or enduring act is what Aristotle calls the form and he distinguishes forms into substantial and

accidental. The substantial form, of which the human soul is an example, is absolutely permanent (this at least Leibniz tells us is his own view), the accidental form is only permanent for a time. The passing act, the act whose nature is transitory, consists in the very action itself. What endows the term entelechy with its peculiar significance and attraction for Leibniz is that it enables him to designate a permanent substantial form which carries with it not merely a simple faculty of being active but also what he calls force, effort, *conatus*, something which, while not itself action, leads to action, and something from which action must follow if there be nothing to stop it. Force if it is not derivative but primitive (as it is in the soul) is ingredient in the substance itself and not a detachable quality of it.

19. If we give the name *soul* to whatever has perceptions and appetitions, in the general meaning which I have just explained, then all simple substances, or created monads, may be named souls. But because feeling is something more than a simple perception I prefer to use the general term monad or entelechy for simple substances which have only perception, and to keep the name *soul* for simple substances whose perception is more distinct and accompanied by memory.

Leibniz reaches the concept of the soul and its activities by a metaphysical deduction and not by a psychological investigation of human experience.

The metaphysical motive is essential to the understanding of the doctrine. Memory quite as much as perception is deduced from the concept of the monad. Memory is not different in nature from perception. It is not a faculty of recalling the past or a power of manufacturing images wherewith to furnish the mind. It implies no psychological theories of association whatever logical laws it may be found to subserve. Memory, for Leibniz, is nothing other than perception of which it is a higher degree. The possession of this higher degree marks its possessor as belonging to an order of monads nobler in dignity and more exalted in the hierarchy. When a monad's perceptions are accompanied by memory its perceptions then not only coexist in the moment in which they come to birth and death, they also succeed one another continuing the past into the present. The rational monad perceives an order of coexistences and an order of successions in its perceptions.

20. We may experience in ourselves a state in which we remember nothing and are without any differentiations in our perception, as when we faint or are overcome by deep dreamless sleep. In such a state our soul is in no way different from the simple monad. Yet since such a state is not lasting, and since the soul recovers from it, the soul is more than a simple monad.

Leibniz here points to the significance of the fact that in our own individual experience we can refer to states of perception in which discrimination is zero

and yet not nothing. We need have no difficulty therefore in conceiving the perception of the simple monad. In his fully developed theory of the soul there is something positive and not merely negative in the confusedness of perception. The passions which enslave the soul are confused perceptions. "According to my system everything whatever which occurs in the soul depends only on itself, its future state follows only from itself and its present state, how then can there be a greater independence than it enjoys? And yet it is also true that there is some imperfection in the constitution of the soul. Everything which happens to the soul depends on the soul but it does not always depend on its will; that would be too absolute. Everything is not indeed even fully known or distinctly apperceived. There is in the soul an order of distinct perceptions and this gives it its domination, but then there is also a range of confused perceptions or passions which puts it in bondage. There is nothing surprising in this for had the soul only distinct perceptions it would be a divinity." (*Théodicée*, 64)

21. It does not follow that the simple substance can exist without any perception. That indeed is impossible for reasons already given. A simple substance cannot be conceived either as perishing or as subsisting unless it have some modifiable character, and this modifiable character is nothing other than its perception. Yet when there is a great multitude of small perceptions but

> nothing distinguished there is the condition of being stunned, just as when we turn continually in the same direction several times together there comes on a giddiness which may make us faint and leave us unable to distinguish anything. And death may bring about this state for a time in animals.

A scientific concept of death, (such as exists for modern biology with its theory of the continuity of life through successive generations of individuals, and its rejection of the theory of spontaneous generation), was non-existent for Leibniz. When he speaks of death, he means the word to be taken in its ordinary meaning as the complete cessation of a specified kind of organized activity which is followed by the dissolution of the organism. In this sense he finds nothing contradictory or even incredible in the notion that animals may actually die and come to life again. It was commonly supposed, for example, before the fact of the migration of birds was observed, that the swallows concealed themselves underground during the winter, literally dead, and coming to life again in the spring. In the case of insects it was hardly doubted at all. One is reminded of the words of Jesus in the fourth gospel : " Verily, verily, I say unto you, except a corn of wheat fall into the ground and die, it abideth alone : but if it die, it bringeth forth much fruit." Also the answer of the Apostle Paul to the imagined sceptic concerning the belief in the resurrection of the body : "Thou fool, that which thou sowest is not quickened, except it die." In these passages death is conceived as a state or stage of a continuous

active process. Leibniz points out the metaphysical implication. If substance be conceived as force or activity then there can be no such thing as death in the absolute meaning, for in the absolute meaning death would mean annihilation and this would negative the essential attribute of substance itself, that is to say, it would negative the reality of the real, the existence of the existent.

22. Every present state of a simple substance is a natural consequence of its precedent state, so that the present is big with the future.

We are to notice here the essential difference between Leibniz's concept of the continuity of an active force and the mechanistic concept of continuity as an interlocking system of events determined by external relations of cause and effect. " It is one of the rules of my system of the general harmony, that the present is big with the future, that whoever sees all sees what will be in what is." (*Théodicée*, 360). The perfect knowledge of God, according to Leibniz, is not that of a mathematician, possessed of all the factors and able to calculate any future state of the universe from its present state, in the manner of a skilled astronomer foretelling an eclipse ; it is perfect knowledge of the kind a psychologist would possess who, by knowing the nature of a conscious being, could foretell his behaviour and thereby determine beforehand what his actions will be under given conditions.

23. When we awake from a stunned condition we become conscious of, or apperceive, perceptions ; it is evident therefore that they were existent immediately before, even though we were not then conscious of them : for a perception can only come naturally from another perception, as a movement can only come naturally from a movement.

The point insisted on here is that the perceptions of the monad arise and produce one another by reason of the monad's nature and not by its power of free creation. They are not dependent on volition. They come naturally from one another just as one movement naturally gives rise to others. The full expression of this doctrine is in the *Théodicée*. It comes in reply to an objection of Bayle who had argued that it is impossible to form ideas unless we know how ideas are formed, a sceptical argument which cuts at the root of any theory of perception. Leibniz replied : " We do not form our ideas because we will to form them ; they are formed in us and by us not in consequence of our will but according to our nature and to the natures of things. They are formed in us as the fœtus is formed in the animal, as a thousand other marvels are produced by a kind of instinct placed by God in nature, that is to say, by virtue of the divine preformation which has created these automata that produce of themselves mechanically such marvellous effects. It is easy to think of souls as being just such spiritual automata, only far more wonderful, and that it is by the divine preformation that our soul produces the

ideas in which our will has no part and to which our art cannot attain. The working of such spiritual automata, that is to say of souls, is not indeed mechanical, yet it does contain within it eminently all that is wonderful in mechanics. The movements developed in the body are concentrated in the soul by representation, forming as it were an ideal world which expresses the laws of the actual world and their consequences. There is however this difference between the perfect ideal world which exists in God and the ideal world of the soul, that the greater part of the soul's ideal world is confused perception. For it is essential to understand, that every simple substance includes the universe in its confused perceptions or feelings, that the succession of perception is regulated by the particular nature of the substance, yet always in a way which expresses the whole of universal nature ; and that every present perception tends to a new perception, just as every movement which it represents tends to another movement. It is impossible however that the soul should know its own nature distinctly, and apperceive how this innumerable number of small perceptions, jammed or rather concentrated together, is there formed. To know this the soul would need to know perfectly the whole universe which it encloses, it would need to be a god." (*Théodicée*, 403)

24. We may see by this that had we nothing differentiated in our perceptions, nothing so to speak, standing out in relief, nothing to give a distinctive flavour, we should be always in the stunned condition. Such is the state of the bare naked monads.

This concludes the doctrine of the nature of substance as active force. What is especially worthy of note is the way in which the dualism of the Cartesians is replaced by a double aspect theory of substance. In realizing mind we idealize nature and in idealizing nature we realize mind. Perception is practically a physical thing for it is universal and does not imply consciousness. Consciousness is not different from perception in kind, and strictly speaking it is not even different in degree, it is the apperception which is a reflexion of perception, a perception of perception. Again, there is no division between the real and the ideal, no separation between the world which exists in actuality and the world which exists in ideal representation. The monad's perceptions are the universe, not perceptions of the universe, that is to say, there are not for the monad two things, its perceptions of the universe and the universe it perceives, there is only one thing, its universe. The universe-in-itself is the monads, each of which exists in itself and for all the others.

25. Moreover we see that nature has given animals some perceptions which stand out in relief, for it has provided them with sense organs, which concentrate numberless rays of light or numberless sound waves of air so that by being brought to a focus they may be made more efficacious. There is something approaching the same contrivance in the senses of odour, taste and touch, and possibly in a number of other senses unknown

to us. Further on I will explain how what happens in the soul represents what goes on in the sense organs.

It is interesting to compare this account of sense perception with the contemporary theory of Locke, which Leibniz, some years before he wrote the *Monadology*, had submitted to detailed criticism in the *Nouveaux Essais*, but had withheld from publication and set aside because Locke, before he could reply, had died. In Locke's view the mind is a *tabula rasa*; the causes of knowledge are external, independently existing material substances; the objects of knowledge are ideas, and the origin of ideas is the qualities of objects which by affecting the sense organs leave impressions on the mind. Taken in the reverse order, the impressions on the mind give rise to ideas, which are the immediate objects of the mind when it thinks; these ideas are sense perceptions, and sense perceptions arise through affections of the sense organs by the various sensible qualities of external objects. The dilemma in such a theory, which is obvious to us and which was exposed by Berkeley, (the dilemma, of which the one horn is that if the perception is not the real object of knowledge then the real object of knowledge is unknown, and the other horn is that if the perception is the real object of knowledge there is no object existing independently of its being known) is avoided altogether by Leibniz. The universe for Leibniz is the perceptions of the mind. Knowing is apperceiving, that is, becoming aware of the perceptions which exist already and which in their very nature are possible ingredients of consciousness.

The part which the sense organs play is not that of producing or even of reshaping perceptions, but of concentrating, focussing, selecting and thereby heightening them with a view to giving distinctness and clearness to what is otherwise massed together and confused.

26. Memory provides souls with a kind of consecutiveness which imitates reason and yet must be distinguished from it. We see that this is so when we observe animals taking notice of something of which they have had similar perceptions before. They are led by the representation of their memory to expect that what was joined with the former perception will now occur again and so they come to have feelings like those which they had then. For example : if we threaten a dog with a stick it will remember the pain which the stick once caused it and will howl and run away.

Leibniz is spared, by his metaphysical concept of reality as timeless, the peculiar difficulty which modern psychology meets in its attempt to define memory. Perception for the psychologist is defined by its reference to an existing object ; memory refers to the past which is non-existent ; perception of the non-existent is therefore a self-contradiction and yet it is precisely this which memory purports to be. For Leibniz the past is not non-existent, it exists in the present which is thereby big with the future. Perceptions therefore

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do not simply arise and perish, rather they are continued into one another, and memory is simply the ability to perceive this continuity, this preservation of the past, this consecutive character of active experience. Leibniz is not concerned to define memory but rather to differentiate it from reason, which is an application of logical principles to the interpretation of reality.

27. The strong imagination, which has this striking and disturbing effect on animals, comes either from the multitude or from the magnitude of their precedent perceptions. For frequently a forceful impression will produce of a sudden the effect which is usually the result of long habit or of many repetitions of ordinary perceptions.

Imagination for Leibniz is not, like reason or understanding, a faculty of the soul. Here he is concerned to prove that it is not imagination, or memory, which distinguishes the soul of man from the animal soul. Both these are explicable in terms of perception which is the generic activity of the monad. The image is not produced by æsthetic creation, on the contrary, it is a phenomenon due to the absence of clear and distinct perception. Thus the tree which I see is a single image just because I have not distinguished its component parts, the leaves, stem, roots &c.

28. Men act just like animals insofar as the consecutiveness of their perceptions is due only to the principle of memory. They are like the empirics who have a simple practice without theory. We are all empirics as to three-fourths of our actions. When we expect the sun to rise tomorrow, for example, we are simply acting empirically, for our expectation has no other ground than that up to now it has always been so. It is only the astronomer who takes the trouble to know the reason why.

The true distinction between man and the animals is not that in man a substantial, sentient and rational soul is united to a material organism, as the Cartesians held. Perception, memory, imagination, association of ideas, learning by experience, are found in animals as well as in man, and the difference is not in the degree or quantity or quality of these characteristics. Man is rational and this character of reason places him in a higher order of being. In man there is a spiritual nature and the possibility of a spiritual life. Man has and the animal has not a rational soul.

29. It is the knowledge of necessary and eternal truths which distinguishes us from simple animals and in endowing us with reason and with the sciences raises us to the knowledge of ourselves and of God. This is what in ourselves we name rational soul or mind.

Each human monad is a rational soul or mind, capable of reflexion, and we now proceed to consider the nature and mode of working of reason in man. The first indication of its reality is the knowledge we find we possess of necessary and eternal truths. This knowledge transcends experience, which the simple animal soul cannot do. The propositions of mathematics are necessary and eternal truths. The multiplication table, for example, is not discovered by the human individual empirically. As soon as it is understood it is seen not to depend on observed uniformities, but to lay down a rule to which all experience will necessarily conform.

30. It is by the knowledge of necessary truths, and by abstractions from them, that we rise to the stage of *reflective acts*, which give us the thought of what is called I, and which lead us to think that this or that is within us. Thus it is that in thinking of ourself we think of *being*, *substance*, the *simple* or the *composite*, the *immaterial*, and even God himself, for in conceiving what is limited in us, we conceive what is without limits in God. These reflective acts furnish the chief objects of our reasonings.

In this article it is clear that Leibniz has in mind the Cartesian principle of the "I think therefore I am" as the starting point of reasoning, and he points out how his own theory goes behind this principle. The *I think* of the proposition is an apperception and

apperception presupposes perception. *I think* in its simplicity and immediacy is not a reflective act. To be reflective it must take some such form as " I think myself thinking " or even the more direct " Cogito cogitare." The " I think " must be the thought thought before the " I am " (the idea of being or substance) can arise.

31. Our reasonings are based on two great principles. The first is the Principle of Contradiction. By virtue of this we judge the self-contradictory to be false, and its opposite or that which contradicts the false to be true.

The Principle of Contradiction declares that of two contradictory propositions one is false the other is true. The opposite or contrary of a false proposition is not necessarily true, but the contradictory of a false proposition is true. For example: if the proposition " this paper is white " is false, then the proposition " this paper is not white " is true ; but it does not therefore follow, because black is the contrary to white, that the proposition " this paper is black " is true.

The connexion of this sentence with the previous one seems to indicate the source from which Leibniz derives this logical principle. It is from the act of reflexion. This is more evident when we take the principle in the form of the judgment of Identity, A is A, or, A is not not-A. To have significance and be raised from pure tautology it must suppose the reflexion of the subject of the proposition on itself.

32. The second is the Principle of Sufficient Reason. By virtue of this we think that no fact can be real or existent, and no statement true, unless it have a sufficient reason why it should be thus and not otherwise, notwithstanding that in most cases these reasons cannot be known by us.

This is the principle which forbids us to regard anything as due to pure chance. It tells us that whatever happens has a cause, however ignorant we may be of the cause, or however impossible for us its discovery may be. It is this principle which has been submitted to the most continuous criticism from Leibniz's time to the present day. It seems to us that unless science adopts it, at least as a postulate, science is itself impossible and yet it is impossible to derive from matters of fact or from science itself any rationality of the principle.

This is how Leibniz describes the principle in the *Théodicée* (44). "The principle is that nothing happens without a cause or at least a determining reason why it happens, something, that is to say, which can offer an *a priori* reason why it exists in this fashion rather than in any other. This great principle operates in regard to all events and there is no case of the contrary. And although most often these determining reasons are very imperfectly known we can never think they are non-existent. Without this principle not only should we be unable to prove the existence of God, we should be deprived of an infinite number of the soundest and most useful arguments of which the principle is the only basis. It admits moreover no

possible exception, for were only one exception admissible its whole force would be weakened. There is indeed nothing so feeble as a system in which all is haphazard and full of exceptions. At least this is not a defect of my system, wherein everything goes by general rules, which just on that very account are limited by one another."

33. There are also two sorts of truths, truths of *reasoning* and truths of *fact*. The truths of reasoning are necessary, and their opposites are impossible. The truths of fact are contingent and their opposites are possible. When a truth is necessary we can find its reason by analysis, by resolving it into ideas and into simpler truths until we come to primaries.

We are now introduced to the important distinction between truths of reasoning and matters of fact, which in one form or another has occupied and still underlies all philosophical discussion. There are some propositions which we judge true because their falsehood is impossible, there are others which we judge true (and of course necessarily true) although no logical impossibility is implied in their falsehood. If two straight lines are radii of the same circle they are of equal length. If a lighted match be thrown into a barrel of gunpowder there will be an explosion. So far as belief and practice founded on belief are concerned there is no difference between the truth of these two propositions and the inconceivability of their

falsehood, but there is a difference in kind between the two truths. In the first case the falsehood would contradict the definitions of circle and radius, for this reason falsehood is impossible. In the second case we have the connexion together of two quite independent facts, and Leibniz sees as plainly as it was seen later by Hume, when he criticized the relation of causality and the idea of necessary connexion, that as matters of fact they are independent. There is nothing in the definition or description of the one fact which makes it impossible that any other fact and not the specified one should follow. The falsehood of every empirical true proposition is always possible.

34. Thus in mathematics speculative theorems and practical canons are reduced by analysis to definitions, axioms and postulates.

The two methods are divergent. In the case of truths of reasoning we proceed by the analysis of concepts. As Descartes had already made clear, the definitions and properties of geometrical figures are obtained from the act by which they are generated. Thus the equality of the radii of a circle follows as a necessary analytical deduction of the mode in which the circle is constructed, that is, by rotating the point of the free arm of a pair of compasses round the point of the other fixed at the centre.

35. In the end there are *simple ideas* which cannot be defined ; there are also *axioms* and *postulates* which cannot be proved, which

indeed are in no need of proof ; and there are *identical* propositions the opposites of which contain an express contradiction.

Simple ideas, primary principles, and identical propositions, are not representative in the meaning the word representative afterwards acquired in the empirical school of thought. For Leibniz they are innate in the meaning that they characterize the rational mind itself. They are not mental substitutes of external independent objects and of their external relations. They are the possession of the rational monad, potential it may be and unexpressed, yet serving, when explicit, to characterize the nature of reason. The " simple idea " of Leibniz is not the " simple idea " of Locke. In fact Leibniz's term would more nearly approach Locke's idea of reflexion. The simple idea is not presented in sense perception as the immediate object of the mind when it knows, it belongs rather in Leibniz's scheme to the *intellectus ipse* which forms the exception to the *nihil est in intellectu quod non prius in sensu fuerit.*

36. But we must also find the *sufficient reason* for the *contingent* truths or truths of *fact*, that is to say, the sufficient reason must be found for the sequence of things extended throughout the universe of created beings. The resolution of this sufficient reason into particular reasons may be carried into a detail which has no finality, on account of the immense variety of nature and the infinite

division bodies can undergo. Into the efficient cause of my present action in writing there enter an infinite number of postures and movements present and past, and into the final cause of this same present action there enter an infinite number of small inclinations and dispositions of my soul present and past.

A contingent fact is determined but not necessary. My present writing, Leibniz would say, is a determined fact with its sufficient reason connecting it causally with the past, and also it is itself determining the future into which it is entering as a sufficient reason of other contingent facts. God by his perfect knowledge of the sufficient reason could foreknow the contingent fact of my present writing. Yet though this contingent fact could have been foreknown, and therefore was certain to exist, it is not a necessary existence because no contradiction is involved in denying the existence of the fact, that is, in conceiving that at this moment when I am writing I should not be writing. In fact it is of the essence of the fact that its non-existence should be as conceivable as its existence.

37. Since all this *detail* itself depends on anterior contingencies and so of more detail, each contingent fact having the same need and calling for a like analysis to give its sufficient reason, so however far we advance we are no nearer finality. The sufficient reason of all

this detail of contingencies, the last or ultimate reason, lies beyond the series, however infinite the series be.

This is the argument on which Leibniz depends for his theory of creation. It follows from the consideration of the infinite regress of contingencies that the first cause cannot be a first sufficient reason of the first contingent fact, it must be a cause which transcends the series. This cause is the bringing into existence by a creative fiat the whole universe of monads. The act of creation is single because though the contingencies are a multiplicity the sufficient reason of one contingent fact involves the sufficient reason of all.

38. Thus it is that the ultimate ground of things must be in a necessary substance, in which the detail of the changes can only exist eminently, as in the source. This necessary substance is what we name God.

As this challenges comparison with Spinoza's concept of the one substance it is important to see wherein Leibniz differs. In the *Théodicée* he says (7), "God is the primary ground of things: for things which are limited, as is everything we see and experience, are contingent and have nothing in them which makes their existence a necessity. It is obvious that time, space and matter, single and uniform in themselves and altogether indifferent, might have totally different movements and shapes and these in a different order from that which they actually have. We have then, to seek the ground of the existence of

the actual world, which is the complete assemblage of contingent things, and we must look for it in that substance which contains in itself the ground of its own existence and is consequently necessary and eternal. So too this cause must be intelligent ; because the existing world is contingent and an infinite number of alternate worlds could equally claim existence without contradiction, the cause of the existence of this world must have had regard to all the possible worlds and their relations in order to decide on this one. This concern of an existing substance for simple possibilities or its relation with them can be no other than an understanding which has ideas of them, and the decision in favour of one can be nothing else but the act of will which chooses it. It is the power of this substance which renders its will efficacious. Its existence argues power, its truth wisdom and understanding, its goodness good-will. This intelligent cause must be infinite in all ways and absolutely perfect in power, wisdom and goodness, since it carries out completely what is possible. As all is bound up together there is no room for more gods than one. His understanding is the source of essences, his will the origin of existences. There in few words is the proof for the existence of a God with his perfections, and of the origin of things by him ".

It will be seen, therefore, that in basing the argument for God's existence on the principle of sufficient reason and not on the principle of contradiction Leibniz conceives the Divine Substance in a quite other relation to us than that of the concept of Spinoza. It is not *in* God that we live and move and have our being, but rather *to* God that we owe our being, and *from* God that we derive it. Thus Leibniz finds no

contradiction in attributing to God understanding and will. They are necessary, for they are not as with Spinoza imperfections which would contradict the concept of infinite perfection. The sufficient reason of the world implies positive understanding in the Creator in order to envisage the ideal possibilities, and good-will in order to actualize the best among the possibles.

39. Now as this substance is a sufficient reason of all this detail, and as all this detail is linked together in one whole, there is only one God and this God suffices.

Such cogency as this argument possesses depends on three considerations : (1) the multiplicity of the contingent facts ; (2) the unity of the sufficient reason which binds them into a universe ; and (3) the impossibility of reaching finality in the detail which the search for reasons discloses. If human reason is justified in using the principle of sufficient reason in its search for the ultimate ground of the universe itself, and if this ground breaks up under the search into a multiplicity of detail, clearly the sufficient reason which is to transcend this detail must itself be conceived as unity and not as more detail. Yet to conceive this " unconditioned ground " as unity is to condition the unconditioned. It may have been this dilemma which led Kant to deny the possibility of pure theoretical knowledge of God.

40. We may also conclude that the supreme substance, which is unique, universal, and necessary; which has nothing outside it that can be independent of it; which is a simple consequence of possible being; must be incapable of limitation and must contain as much reality as possible.

Substance is here conceived not spinozistically as the reality of the finite beings which are modes of it, but as the reason which suffices for their existence. Finite things have their own natures, and therefore their reality, yet they are dependent on God for the sufficient reason of their existence. One is reminded throughout this proof based on the principle of sufficient reason of Pascal's ironic description of the sufficient grace which is insufficient. " N'est-ce point ici quelque chose de semblable a cette *suffisance* qui ne suffit pas ? "

41. Whence it follows that God is absolutely perfect ; the *perfection* being nothing but the magnitude of precise positive reality when the limits or bounds to reality in the things which possess it are removed. Where reality is unbounded, that is to say in God, there is absolutely infinite perfection.

The idea which underlies the conception of the perfection of God in this section is that of the divine wisdom manifested in creation. Creation is the

bestowal of existence on natures which have limitations, this means that their reality is limited by possibility. The omniscience of God has enabled him to realize the highest possibility.

42. It follows also that while creatures derive their perfections from the divine influence, they derive their imperfections from their own nature. This nature is incapable of existing without limitations. It is in this incapability of creatures to be infinite that they are distinguished from God.

In the translations of Latta and Montgomery, the following sentence is included in this section. "An instance of this *original imperfection* of created beings may be seen in the *natural inertia* of bodies." The authority for this would seem to be a note in Gerhardt's edition of the *Philosophischen Schriften* (VOL. VI.) " In der von Leibniz revidirten ersten Abschrift findet sich hier noch folgender Satz : Cette *imperfection originale* des créatures se remarque dans *l'inertie naturelle* des corps." Leibniz seems to be referring to an illustration which he had used in the *Théodicée* (30) and also in other writings to elucidate his reconciliation of the existence of evil in the creature with moral perfection in the creator. The illustration is of vessels variously laden all of which are being transported on the same stream. The heavily laden move more slowly than the others, and this retardation is not due to anything lacking in the stream as the source of the movement but to something negative in the vessels themselves.

This completes the first proof of the existence of God. It is the argument from the conditioned universe to the unconditioned cause. It is in one essential the same as the argument of Spinoza, insofar, that is to say, as it affirms the first cause to be of necessity *causa sui*. The unconditioned cause of the series of conditions cannot itself be resolved into one of the conditions in the series. Leibniz avoids the deterministic and pantheistic conclusion of Spinoza by an intellectual device. God is perfect intellect. Omniscience enables God to foresee the future actions of free spirits in the simple contemplation of their natures. Therefore in creating a world of free spirits he can by prevision foreordain their harmony.

43. It is true moreover that in God we have not only the source of existences but also of essences, insofar as essences are themselves the reality or stand for what is real in the possibility. This is because God's understanding is the region of the eternal truths or of the ideas on which they depend, and because without God there would be nothing real in the possibilities, not only nothing existent but nothing even possible.

The argument of this important section is that not only what is actual but also what is possible must have its source in something actual and real, and this source must be anterior both to existence and possibility. This source is the understanding of God, the locus or region of the ideas anterior to their realization.

It is by this distinction that Leibniz reconciles the existence of evil. God's understanding is not something God has created, it is the source or ground of God's actions. The eternal truths, not matter, are the source of things. God's understanding is therefore the ideal cause of evil as well as good. Evil consists in privation. It has no efficient cause but only an ideal cause. It is a kind of inertia, or resistance in the nature of things, which has to be overcome.

44. For if there be a reality in the essences or possibilities, or indeed in the eternal truths, this reality must necessarily depend on something already existent or actual, consequently on the existence of the necessary being whose essence includes existence, or in whom it is sufficient to be possible in order to be actual.

This is the second proof of the existence of God. It had been argued that eternal truths could exist independently of whether God did or did not exist. inasmuch as they are conceived as true of any possible world. Leibniz argues that they have no meaning except in reference to an understanding. A world not dependent on ideas would be a world without order. The fact that there is order in nature is the affirmation of mind.

45. Thus a privilege attaches to the concept of the necessary being, God, inasmuch as we can affirm of God, that if he be possible, he must

be. And God is possible for nothing can hinder the possibility of what is enclosed within no boundaries, has no negation, and consequently no contradiction. This possibility alone suffices for the *a priori* knowledge of God's existence. We have already proved this existence *a priori* from the existence of eternal truths, and now we are able to prove it *a posteriori* from the existence of contingent beings, the ultimate or sufficient reason of which can only be the necessary Being, the Being who is himself the sufficient reason of his being.

This third proof of God's existence, embracing as it does the other two, supplies the absolute basis of Leibniz's system and is practically identical with the general foundation of metaphysical science as Descartes, Spinoza, and the seventeenth century philosophers accepted it. It is the position from which Leibniz attacked Newton's doctrine of space and time and Locke's theory of knowledge.

46. Yet we are not to suppose, as some philosophers have imagined, that since the eternal truths are dependent on God, they are therefore arbitrary and dependent on his will. Descartes, and later Monsieur Poiret, appear to have taken this view. It is contingent truths alone which can be said to depend on

God's will, for the principle of these is fitness, they imply power to choose the best. Necessary truths depend solely on God's understanding of which they are the internal objects.

The opinion of Descartes that the " eternal truths " are dependent on God's will, is expressed in two very interesting passages in his correspondence. Writing in 1630 to Père Mersenne he says : " In my Physics (referring almost certainly to the early work which had been withdrawn from publication) I have left untouched several metaphysical problems and this in particular : that the metaphysical truths which you call eternal have been established by God and depend entirely upon him just as all the rest of creation. To say that these truths are independent of him would be in effect to speak of God as we speak of a Jupiter or a Saturn and make him subject to the Styx and to the Fates. I beg you will not hesitate to assure everyone and publish everywhere my view that God has established these laws in Nature as a king establishes laws in his kingdom ". He then goes on to meet the objection that God might change the eternal truths in the same way that a king can change his laws. " Yes ", he replies, " if God's will can change ". " But God's will is free ! " " Yes ", he replies again, " but his power is incomprehensible ; and generally we can be well assured that God can do what we can understand, but not that he can do what we cannot understand, for it would be rash to suppose that our imagination has as wide an extension as his power."

In another letter written by Descartes about 1644 to an unnamed Jesuit father, he says : " With regard to the difficulty of conceiving how it was free and indifferent to God to make that it should not be true that the three angles of a triangle are equal to two right angles, or generally that two contradictories cannot exist together, we can easily avoid it by considering that the power of God can have no limits, and then by considering also that our mind is finite, and created with such a nature that we can conceive as possibles what God has willed to be really possibles, but not of such a kind that we can conceive as possibles those which God could have made to be possibles but which he has actually willed to make impossibles ".

Pierre Poiret (1646-1719) author of a treatise on *Economie divine* was a Protestant minister. He was at first a Cartesian but became a mystic. He held in opposition to Malebranche that the world of ideas is the free creation of God, who could have created other ideas and other truths. As, however, ideas are representations of the divine nature they could not in any case be other than good and true. Poiret is quoted at some length in a note of Bayle's to the article *Rorarius*. He seems to have held a curious theory that the body which the soul parts with at death is only of the nature of an outer bark or envelope, beneath which is a real body of subtle matter to which the soul is inseparably united. It was these subtle bodies made visible which appeared to the favoured disciples who beheld Moses and Elias discoursing with Jesus at the Transfiguration.

47. Thus God alone is the primitive unity, or the simple original substance of which all the created or derivative monads are productions. They are brought to birth, so to speak, by continual fulgurations of the divinity from moment to moment, they are limited by the receptivity of the created monads, which limitation is an essential part of their nature.

Leibniz's idea would seem to be that God produces monads continually as we produce thoughts. At first these are ideas in God's mind, then they are realized by his free act.

Leibniz is now proceeding to set forth his theory of the order of genesis of the universe of monads.

48. In God there is *power*, which is the source of everything, then *knowledge*, which contains the detail of the ideas, and finally *will*, which makes changes or productions according to the principle of the best possible. And what these are in God responds to the perceptive and appetitive faculties in the created monads, the faculties which constitute their basis as subjects. In God the attributes, power, knowledge and will, are absolutely infinite or perfect, while in the created monads or in the entelechies (or *perfectihabies*, as Hermolaus Barbarus translates the word)

there are only imitations of the attributes, proportionate to such perfection as the monads have.

To understand the monadology we must distinguish between the essence and the existence of the monad. The world, the universe of the monads, has been created. What is implied thereby ? First, the intelligence of the cause ; for God must have understood the possibilities represented by the essences. Second, the goodness of the cause ; for God must choose among the possibilities. Third, the power of God ; for he gives existence to the universe he has chosen as the best of the possibilities. The monads could not have come into existence as the act of a blind or unintelligent power, because their creation involves the choice of possibilities, and it is impossible to exercise choice of possibilities unless there be the knowledge whereby to determine the choice. Consequently the essences witness to the perfection of understanding in God, the existences to the perfection of good-will. But why then is there evil ? And how does evil exist for God ? Evil exists for God in his understanding only, that is he knows evil as a possibility, for it is essential he should know the evil if he would choose the best. In choosing the best the goodness of God appears in its perfection. Evil comes by God's knowledge but not from God's choice.

Hermolaus Barbarus (1454-1493) was a noble and learned Venetian, the author of numerous works some of which were still being republished in the sixteenth century. The book from which Leibniz quotes was probably *Themistii paraphrasis in Aristotelis posteriora*

analytica latine versa. (Paris, 1511). In the *Théodicée* Leibniz is rather more explicit and deals more fully with the meaning of the work entelechy. " Aristotle has given the generic name entelechy or act to the soul. The word entelechy is apparently derived from the Greek word which signifies perfect,and this is why the renowned Hermolaus Barbarus expresses it in latin, *verbatim*, as *perfectihabia*, for the act is the accomplishment of the power. There was no need for him to have consulted the devil, as he is reputed to have done, in order to learn this ". (*Théodicée*, 87). The passage is a little obscure as it stands but Leibniz goes on to elucidate it by reference to the Aristotelian distinction of two kinds of act, the permanent and the successive. The permanent or durable act is identical with the form, and the form may be either substantial or accidental. Leibniz then gives as his own view of this distinction that the substantial form of which the soul is the instance, is entirely permanent while the accidental form is only temporary. The act which is transient, that is, the act of which the nature is to be transitory, consists in the action pure and simple. Here, he tells us, comes in the value of the term entelechy, for entelechy carries with it not only the idea of a simple faculty of acting but also the idea of what we call force, effort, *conatus*, the idea of something from which action must follow so long as there is nothing to stop it. " Faculty " is only an attribute of substance or even it may be a mode, but " force " when not an ingredient of substance itself, that is, when it is not primitive but derivative, is a quality distinct and separable from substance. We can conceive the soul as a primitive force, modified and varied by qualities and exercised in actions.

Leibniz does not appear to have gone direct to Aristotle for his idea of entelechy. He seems to have been particularly struck with the latin jargon *perfectihabies* (a word which will not be found in the classical dictionary) as expressing the kind of perfection which every monad possesses in common with the supreme monad; that is to say, a perfection which the monad can possess without being perfect in the transcendent meaning. It is the perfection of the self-regulated machine. Entelechy is perfection in the meaning that it is the principle of the whole, controlling and subordinating the parts, without external compulsion. The differentiated organic activities act together for a common end.

49. The created monad is said to *act* outwardly insofar as it is perfect ; and to suffer inwardly or be acted upon by another insofar as it is imperfect. Thus *action* is attributed to the monad to the extent that its perceptions are distinct and *passion* to the extent that its perception is confused.

Here we enter on the important part of the monadology which treats of the nature of finite individuals or created monads. God, for Leibniz, is unconditioned. He is neither self-created nor self-creating. He creates the monads not in order to actualize modes of his own substance but to give existence to ideas which have presented themselves as possibilities in his mind. Monads are other selves. This is involved in the concept of God's perfection. The concept of God is all sufficient, including God's existence and excluding

any need for development or urge to create new expression. The creation is the outcome of perfect wisdom and goodness, the actualization of the possibilities ideally present to God. God in creating monads is not fulfilling a need of his own nature for God is perfect intellect.

What then are the finite individuals or created monads? They are simple substances brought into existence by the creative act of an omniscient God. As possibilities they were present in God's mind as his thoughts or ideas before they were actualized, and their actualization was consequent on God's perception of the harmony which would result from their activity. We have therefore to conceive the creation not as the successive actualization of possibilities but as the actualization of the whole universe once for all.

What then is the nature of these finite individuals, this universe of self-acting monads? The first crucial point is that every created monad of necessity falls short of perfection, in the very fact that it is created not uncreated, finite not infinite. We have to understand therefore in what way every monad can be a complete substance and yet there can be infinite differences between one monad and another. How then can a monad be at the same time perfect and imperfect? Every monad is perfect in the sense that it perceives the whole universe and yet a monad may know infinitely little or nothing of the universe it perceives. For Leibniz this is one aspect of the general problem of evil and he brings to its solution the principle which serves him in the general case, namely, the degree of confusedness in the monad's perception. The finite monad is both active and passive, acting and acted on, but while activity is a positive attribute, passivity is

privation. Like evil, and error, and malice, ignorance is privation. The tower which at a distance appears round is really square. That I should think of it as it appears follows naturally from what I see. The false judgment consists in stopping short, in not examining further.

The hierarchy of the monads is based on this degree of perfection or imperfection. Monads differ in dignity not by the positive attributes which some possess and others lack but by the degree in which perception is distinct and adequate, or obscure and confused.

In this doctrine of the privative character of passion Leibniz is in complete accord with Spinoza. Thus Spinoza says : " Our mind acts certain things and suffers others : namely, insofar as it has adequate ideas, thus far it necessarily acts certain things, and insofar as it has inadequate ideas, thus far it necessarily suffers certain things ". (*Ethica* III. prop. I.) Again after the proof of the proposition that, " the actions of the mind arise from adequate ideas alone, but passions depend on inadequate ideas alone", (III, 3) he adds the note : " We see thus that passions have no reference to the mind save insofar as it has something which involves a negation, or insofar as it is regarded as a part of nature which through itself and without others cannot be clearly and distinctly conceived."

50. One created monad is more perfect than another insofar as there may be found in one the *a priori* reason of what is happening in another, and this is what we mean when we speak of one monad acting on another.

Were there no relations between the created monads there would not be the universe of monads. The monads as simple substances are independent and it is inconsistent with the definition of them to represent their relations in the manner in which physical things are represented in reciprocal relations of action and reaction. Yet they must have relations, otherwise they would not compose an aggregate. Further, their relations must be such that they constitute only limitations or privations of the self-originated, self-directed, actions of the monads themselves. Thus a monad may avail itself of the activities of other monads by making their activity serve its activity, but a monad cannot make use of another monad as a man uses a tool. Abundant illustration of this kind of harmony of independent activities is presented in nature. Biology is unintelligible without such relations as privations and inhibitions.

Leibniz now proceeds to expound his doctrine of the nature of the relations between the monads.

51. Simple substances exercise only an ideal influence on one another, and this by the intervention of God ; for, inasmuch as a created monad must have had its place in the ideas of God before it existed in the universe, so it may with reason claim that God in regulating the other monads from the beginning should have had regard to it. Since, then, a created monad can exercise no physical influence on the inner being of another,

the dependence of one monad on another can only be in this ideal way.

Leibniz has to reconcile two seemingly incongruous facts ; first, that the universe is composed of simple substances, and second, that the aggregate of these substances is a universe. Neither fact can be denied or explained away and the two facts are mutually interdependent. There is a composite universe and its constituents are simple substances. Neither of these facts is unconditioned, both, by an *a priori* necessity of thought, require subsumption under the principle of sufficient reason. The nature of the substances is finite and their activities are organically interdependent. Hence we must conclude that the monads have come into existence by creation, and that creation was a unique act, since the many monads are one universe. To reconcile the two facts Leibniz refers both of them to God and deduces from them the divine attributes, wisdom, goodness and power. The facts themselves, he reasons, were possibilities before they were existences. As possibilities their reality was purely ideal. *To exist in idea* is to arise as thoughts in a mind, *to exist in fact* is to be self-acting and independent. Hence the conception of the pre-established harmony—the creation of reals which were not only possible but compossible. Now this is the doctrine which to all the critics has appeared as the introduction of God from a machine. The facts themselves, it is said, are hopelessly irreconcilable, so by an ingenious stage contrivance God is introduced and endowed *ad hoc* with the attributes necessary for the accomplishment of the task. Those who take

this view fail to appreciate the insight of Leibniz. His doctrine may be unacceptable in the light of the development of modern scientific theory but it is not fantastic and the God of the pre-established harmony does not step out of a machine.

The relation of the created monads to God is conceived on the analogy of the relation of our actions to our personality. Before our actions are actualized they exist ideally in our mind as ends or purposes or as means to ends. In acting we give existence and independence to our ideas. Acts become deeds. In like manner God actualized his ideas in creation. It is true that our actions are performed continuously while God's creation is conceived as effective once and for all. This is because Leibniz conceives God, in common with the accepted formula, as the infinitely perfect being and therefore as archetypal. The idea of God as identical with the living principle, the *élan vital*, would have clashed with the preformation theory which Leibniz held in common with the advanced scientific opinion of his time.

There are in fact only two alternative views of the nature of finite individuality. In contemporary thought they are referred to as the substantival and the adjectival views. If the individual is a substance, a monad, a self-owned activity circumscribed in its range, then its relations must be ideal, for real relations would clearly be destructive. Leibniz has shown this in his criticism of the theory of atoms and the void. If on the other hand relations are real, if the universe consists of actions and reactions, then the individual is ideal, an adjectival mode of being. Leibniz rejects the adjectival view and adopts the substantival view. This commits him to the conception of God as the

sufficient reason of the existing world and requires that he should discover the logical implications of the act of creation. Where else but in the divine mind can he put the ideal relations ?

The intervention of God therefore has a distinctive meaning for Leibniz as an essential part of his metaphysical system. The doctrine is not to be confused with Malebranche's " vision in God " or with Berkeley's " continuous perceiver."

52. Thus it is that between created monads actions and passions are mutual. For God comparing two simple substances finds in each reasons obliging him to adapt one to the other. Consequently what is active in some respects is passive from another point of view ; it is *active*, insofar as what we know distinctly in it serves to give a reason for what occurs in another ; and it is *passive* insofar as the reason of what occurs in it is found in what is distinctly known in another.

The problems here may be stated as follows : If the relations between monads are ideal and not interactions, how are we to account for the mutual adaptations of the monads to one another which appear as action in one monad and as reciprocal passion in another ? The reply is that the activity of the monads, perception, which in its general character is one and identical in all, (perception being the characteristic monadic activity) may present two aspects according as we take account of its degree of clearness and

distinctness or of its degree of confusedness and obscurity. This double aspect must have entered into the creative design itself. We have already seen that passion is privative, we may now see how action can be viewed from two standpoints according to the distinctness or obscurity of the perception which gives it significance. The instance which seems to be continually present to Leibniz in this relation of the monads is the connexion of soul and body. The soul-body relation appears as pure action in the soul and as pure passion in the body. The interpretation is that the soul perceives distinctly in itself what serves as a reason for the action of the body, and the action of the body is experienced as passion, because its sufficient reason is only known distinctly in the soul.

53. Now in God's ideas are an infinity of possible universes only one of which will exist ; there must therefore be a sufficient reason of God's choice determining which one rather than any other shall be.

This and the next three sections expound Leibniz's doctrine that the world which exists is the best possible. It is a little curious to see that he has no use in his philosophy for the teleological argument. On the contrary there is a complete reversal of the ordinary demonstration which takes as its premises the evidence of design in nature and concludes from it the wisdom of the designer. The reason is that Leibniz's concern is not to glorify the work of God in creation, but to interpret rationally the existence of evil. The world though it may be imperfect and contain evil is the best

of all possible worlds simply by reason that it exists. If evil be necessary, then necessary evil is not evil but good. The world for Leibniz is not an adaptation of means to end, a carrying out of purpose by devising skilful contrivances, and God is not a worker in clay. The universe consists of free self-acting natures, and the wisdom of God in creation is not that of an artificer but that of an adapter. His wisdom is displayed not in craftsmanship but in choice.

This concept of God is as essential and necessary a part of Leibniz's system as are the constituent units. Without God both the logical principle of non-contradiction and the logical principle of sufficient reason would lack their metaphysical counterpart.

54. The sufficient reason of God's choice can only be found in the *fitness*, or the degrees of perfection that these possible worlds contain ; for every possible (ideal) world has a right to claim (actual) existence in proportion to the perfection it contains.

The reason of God's choice which has determined the existence of the world is a self-evident principle and may be expressed in a perfectly natural way and as an ordinary scientific concept. Suppose a naturalist marvelling at the ingenuity displayed in the construction of an organ serving a living function such as the human eye. The parts are infinitely complex and the slightest lack of foresight in the construction or lack of adaptation in the assembling would clearly spell failure. Yet the eye most clearly has not been manufactured in this way ; the unity and the simplicity

of the function alone have determined the construction and assemblage of the parts. In such way Leibniz points to the existence of the world as furnishing at once why it is what it is and not other. Just as the mechanism of the eye is subservient to its function, and the function of the eye is that for which the mechanism exists, so the individual monads are subservient to the universe, and the universe is that for which the monads are created and to which they are adapted.

55. The reason why the best of all possible worlds is the world which exists, is that God's wisdom makes him know, his goodness makes him choose, and his power makes him produce, the best possible.

The existence of the world is not arbitrary but necessary in the meaning that it follows from God's attributes and not from a capricious exercise of his will. The interest of the doctrine is that it brings us in view of the modern naturalistic concept of a creative evolution, so far at least as such a view was possible in a mathematical age. God is conceived as pure intellectual activity and every possible self-acting nature is present to his mind as idea. The creation is not the projection of a plan, and the constructive work of its realization, but the changing of ideal possibilities into independent actualities.

56. This bond or adaptation of all created things to each, and of each to all, causes every simple substance to have relations which express all

the others, and consequently each created monad is a perpetual living mirror of the universe.

Leibniz is following out the implications of his guiding concept. The universe is not static, it is not a system of interacting material objects with real relations of position, succession, action and reaction. The universe is dynamic, a living universe without any inert substratum, its unit activities are really independent though ideally related. These ideal relations are not qualitative chemical properties of things, not yet are they quantitative mathematical coordinates, they are adaptations which harmonize the activities of the individuals in the general activity of the whole. The universe consequently is mirrored in every monad in the sense that in every monad can be read the adaptations which make its presence and activity realizable in the living whole.

57. As one and the same city looked at from different sides appears different and presents innumerable aspects, so likewise it comes about that there are as many different universes as there are simple substances the multitude of which is infinite. All these different universes are, however, only perspectives of one universe from the different view-points of each monad.

This illustration enables us to represent distinctly Leibniz's scheme of the fundamental metaphysical

reality of the universe. Taken in its existence there is one universe, the universe of the monads. This universe is a composite or aggregate of the individual activities each of which in its existence is inviolate. The activity of each monad, perception, brings it about that the universe is mirrored in each monad. The aspect of the universe thus mirrored is different for every monad and private to it. What each monad possesses therefore is a perspective, and every perspective is different by reason of the fact that it is the monad's individual viewpoint. There are therefore as many different universes as there are individual monads although these different universes are only perspectives of the one real universe which is the composite of the individual monads.

It will be seen therefore that Leibniz does not mean (as his doctrine is so frequently represented as meaning) that the one universe is the totality of perspectives. As well might one suppose the city to be only the totality of the views which have been or can be taken of it. We must distinguish Leibniz's doctrine of reality from the theory of some present-day philosophers according to which objects are composed of sense-data and any particular object is no more than the class of its appearances. Leibniz has a realistic theory of the universe which implies a purely idealistic theory of knowledge.

58. This is the means of securing the greatest possible variety with the highest possible order, that is to say, it is the means of obtaining as much perfection as possible.

The perfection of the created world is of a different order to the perfection which is a divine attribute. The perfection of the actual existing universe, that is to say, an existing perfection as distinct from an ideal perfection, consists in the infinite variety of free activities, independent individual unit constituents, developing in absolute harmony. The perfection of God is the perfection of a simple substance, the activity of the supreme monad raised to its highest power. The perfection of the created universe is the perfection of a composite. Were every created monad perfect in the sense in which God is perfect, inconsistency and contradiction would be introduced into the very notion of a composite, and would make a universe unintelligible. There cannot exist a plurality of perfect monads, either as a universe or in any other way, for the same reason that there cannot be a plurality of Gods. This is plain to ordinary reflexion. Only one God can be infinite for if there are two infinites both are finite. Only one God can be omnipotent and omniscient, for two would limit and therefore negate the power and knowledge of each. Insofar therefore as the universe of created monads of necessity falls short of the perfection which belongs to God only, it must present an aspect of imperfection, and its perfection will exist only in being the greatest degree of perfection possible. In precisely the same way we may speak of the perfection of an organism as consisting in the variety of function of the constituent cells and the harmony and unity of the whole.

59. Moreover it is only this hypothesis, the truth of which I claim to have proved, that brings into full relief the greatness of God. Even Monsieur Bayle may be said to have acknowledged this in the very objections he brings against it in the *Dictionary* (*Article, Rorarius*). He is inclined to think that I assign too much to God, in fact more than is possible. Yet he is unable to allege any reason why this universal harmony, which causes every substance to express exactly all the others by the relations it has to them, should be impossible.

We touch here on a difficulty which is not satisfactorily overcome. Leibniz shews himself to be acutely aware of it even while claiming to have surmounted it. God's omniscience enables him to read the eventual actions of all free agents in the fact that the nature of each agent is open to God's inspection, or rather present to God in idea before creation. Yet in creating the natures God does not predestine, or decree, as the theological doctrine termed it, the actions. Does this relieve God of responsibility for the actions when creating the natures? Leibniz insists that it does. It is rather like arguing that introducing a wolf into the sheep-fold, well knowing the wolf-nature, involves no responsibility because it is not your knowledge which gives efficiency to the wolf's actions. The interest of this is the instance it affords of an ambiguity in Leibniz's conception of God. If God is a monad then not only is God's individuality inviolate,

but even God cannot violate the individuality of the created monads. The monas monadum, equally with the simple monad, has no windows, and is in ideal relation only with the universe.

60. Further, in what I am now going to say, we may see the *a priori* reasons why things cannot be other than they are. It is because God in regulating the whole must have had regard to each part and particularly to each monad. Since the monad's nature is representative its representation cannot be restricted to a part of things only. It is true that in regard to the detail of the whole universe this representation is confused, and each monad's distinct representation is confined to a small part only, namely, to those things which are nearest to it or else of greatest moment in relation to it, for otherwise each monad would be a divinity. It is not in the object but in the modification of the knowledge of the object that the monads are restricted. They all, in their confused perception go to infinity, to the whole, and they are limited and distinguished by the degrees of their distinct perceptions.

The monads perceive the same universe each from an individual view-point. But although the whole

universe is mirrored in each monad, it is only a very small part which is expressed distinctly, namely, that part which is in relation to the body to which the monad corresponds. The body accordingly constitutes the monad's view-point.

What distinguishes the monads, and grades them, is not any geometrical or numerical relations which may be supposed to assign them separate ranges of activity, but the proportion of distinct perception in the confused perception of the whole universe which is mirrored in each monad. Thus to take our own selves, we have distinct perceptions of our own body, more or less distinct perceptions of the things in the environment of our body, and a general confused perception of the background. At this point however the concept of infinity, and the contradictions involved in the ordinary attempt to apprehend it, present a serious difficulty. Leibniz appears to think this is sufficiently met by contraposing to the infinite variety of the universe the infinite comprehension of God. The world as represented ideally in God's mind is infinite and God's mind in its comprehension is infinite. Therefore, Leibniz argues, the infinite universe is adequately represented by clear and distinct ideas in the infinite mind. The natural inability of the finite to apprehend the infinite does not make the infinite object finite, nor does it cut out all objects beyond a certain range, it simply brings it about that the infinite object is perceived confusedly and devoid of clear outlines.

It is possible that this idea of confused perception may have been suggested to Leibniz by the fact that objects when magnified by the microscope do not resolve themselves into enlarged units but gain an ever increasing and apparently unlimited complexity.

It is most important to keep constantly in mind that the units of the monadic universe are not infinitesimal either in their extension or intension.

61. In this characteristic of the monads (that their restrictions are not in the object but in the modifications of knowledge of the object) the composites accord with the simples. For the whole is a plenum and it is this being a plenum which binds all matter together so that every movement has an effect on distant bodies proportional to the distance. Each body then is not only affected by the bodies in immediate contact with it and responds in some way to everything which happens to them, but through them it also responds to what happens to them by reason of their contact with other bodies, and this communication will extend indefinitely however great the distance. Consequently each and everybody responds to everything whatever which is going on in the universe. Anyone therefore who could see all would be able to read in each what is happening everywhere, even including all that has happened and will happen, he would observe in the present what is distant in time as well as what is distant in space. Σύμπνοια πάντα said Hippocrates. A soul, however, can only

read in itself what is distinctly represented therein, it cannot open out immediately to itself all that is enfolded within it for this extends to infinity.

Leibniz has now completed his theory of the simple substance and he turns to the still more important theory of the composite. He seems to contemplate with never-ceasing wonder and awe the living universe as it reveals the omniscience and power of the divine artificer. The universe of God's creation is not a mere aggregate of simple substances exhibiting an infinite variety combined with an absolute harmony, it is much more. It is a divine machine, every part of which is a machine, which could only be actualized by the nature of the units God has chosen for its construction.

There are two sides from which we may regard the nature of the monad. We may consider it in what is implied by its individuality—the freedom of its activity, the inviolability of its existence, its windowless isolation. It has another aspect. The monad is by nature representative and the representation essential to it is unlimited. It follows, therefore, that to anyone to whom the monad's nature is open to inspection, and who can read what isthere represented, the universe of monads is inscribed in every monad. It is with this material—with monads each representative of and representing all—and not with potter's clay, that the great artificer has worked.

We are introduced at once therefore to the crucial problem, the relation of soul and body. It is well for clear understanding to take as the type of the simple substance the rational soul, and as the type of the

composite the living body, and then try to apply Leibniz's analogy of movement in a plenum. We must keep constantly in mind that space and time, which are inseparable from the concept of movement, are for Leibniz ideal relations, only referring to the representative order of the monad's perceptions and not to the relations between the monads. The particular application of the analogy of movement is that while God is able to read at once in the representations in the soul the whole universe therein represented, it does not follow that the soul itself is able to unfold in distinct ideas the universe confusedly mirrored to it and represented in it. Thus when we present the universe to ourselves in its material aspect as a plenum we see that every particle of matter though affected by every movement of any particle, however distant, is only immediately affected by the particles with which it is in contact. Precisely in the same way the soul is affected by everything which happens in the universe but is only immediately affected by the body. The whole nature of the function which the senses perform in knowledge, and the general role of sense experience in mediating knowledge of the infinite universe, is suddenly illuminated. The soul has in its immediate vicinity, as it were, (the metaphor is spatial) a ring of its clear and distinct ideas. These are the body, or perhaps we ought to say the ideas which represent the body (for the monads of the body have their claim to reality). The body therefore is the soul's clear and distinct ideas, and through this body the outer penumbra of confused perception affects the soul.

How then, it may be asked, does this accord with the theory of pre-established harmony? The relation

between soul and body in Leibniz's scheme is an ideal not a real relation. The source or spring of the activity exists in each and is not derived from the other, and the thoughts which express the body are independent. They harmonize in the manner in which two clocks accord when regulated in advance by a skilful clock-maker. It is another aspect of the problem which here engages Leibniz. On what principle, he enquires, can they enter into a composite? For the answer he appeals to their representative and not to their monadic nature. It is because the soul has clear and distinct ideas of the body that the more or less confused ideas of the universe, of which soul and body are part, can affect the soul. The soul cannot read in the body what is represented therein in regard to the universe. It can only read what is represented in itself, and it is the clearness and distinctness of its ideas of the body which in its representation separate the body from the world and make the soul-body a composite.

Spinoza has a very similar doctrine. "The object of the idea constituting the human mind is the body, or a certain mode of extension actually existing and nothing else." (*Ethica* II., prop. XIII.) It has however a different bearing conformably with the very different metaphysical principle of Spinoza. Mind and body are for Spinoza two aspects of one reality, each aspect, however, having its indefeasible claim to existence, the mind as a mode of thinking, the body as a mode of extension, both thinking and extension being attributes of the one substance, God. Leibniz on the other hand takes the simple substances as independent reals, and the composites as formed by ideal relations, made possible by the representative nature of the reals.

62. Thus although each created monad represents the whole universe, it represents more distinctly the body which is particularly affected by it and of which it is the entelechy. As this body expresses the whole universe through the connexion of all matter in the plenum, so the soul also in representing its body, which belongs to it in an especial way, represents the whole universe.

To follow the important argument which runs through the remaining sections of the monadology, we must keep in mind that it is no longer the *reality* but the *ideality* of the world which Leibniz is interpreting. The relations between the monads are ideal relations because the nature of the monads is to be representative. Real relations in Leibniz's conception of the universe would simply be destructive of the reality of the constituent units. Let us recapitulate : The universe is a composite of created monads; the creation of the monads means that they arose in God's mind as ideas and were actualized ; the universe is therefore the realized expression of God's thoughts, the outcome of omniscience and power ; the universe is a divine machine, a living whole in which the living parts conspire together (this is the meaning of *σύμπνοια πάντα*). We have now to follow out the nature and working of the ideal bond which joins together all and makes the many one.

It is worth remarking that the same problem of reality and ideality which Leibniz here presents in its metaphysical form underlies modern scientific realism.

The physicist has to distinguish sharply at the outset, the ideal order in which knowledge of the external world arises in sense experience, and the form it assumes in experience, the sensations and perceptions of the mind, from the real order of the real units which have to be conceived as the determinant of the character of sense knowledge. No sooner however is the object conceptualized and reduced by scientific analysis to the simplest ultimate real units (quanta of radio activity, single electric charges, or whatever the irreducible units be) than the problem arises how by mere complexity of arrangement (which is all that physical science leaves room for) first the phenomena of the living world, then the phenomena of mind, emerge. Even the physicist is compelled to fall back on a theory of parallelism to allow for the two orders, real and ideal, which are for him united in fact though impossible to reconcile in theory. Leibniz with full consciousness of the difficulty from the outset, because he starts with the metaphysical interest, forestalls it. The real units of the universe being activities and not inert mass particles, are already ideal through and through in their ultimate nature.

63. What we call a *living thing* is a monad which is an entelechy together with its body ; what we call an *animal* is a monad which is a soul together with its body. Now the body of a living thing or of an animal is always organic, for since every monad is a mirror of the universe after its manner, and since the order which rules throughout the universe is perfect,

there must also be an order in the body which is representing the universe ; that is to say, as there is an order in the perceptions of the soul so there must be an order in the body through which the universe is represented in the soul.

The term " entelechy " is used by Leibniz with wider comprehension than the term " soul " but there is no difference in kind. There is an entelechy of a plant or of any living thing even though it have no distinct perceptions, a soul has always some degree or range of distinct perception and a rational soul has also apperception or self-consciousness.

The idea which Leibniz develops in this and the following sections is as follows : the body insofar as it fulfils the function of body to the soul is not a reality of the same order as the soul. It is composite and not like the soul a simple substance. The relation of the soul to the body is that of the dominant to subservient monads. Now the constituent monads of the body are, like all monads, inviolable. The organization of the body, in respect of which the various activities subserve and obey the behests of the soul, is rendered possible by the representative nature of every monad and the ideal nature of monadic activity. The dominance of the soul is a consequence of the amount and range of clear and distinct perception which illuminates the zone of action. Leibniz does not hold that the marvellous adaptation of soul and body arises naturally as a simple and direct effect of the monad's perception, it is a pre-established harmony which points to the wisdom of God, manifest in creation.

What is important in this theory from the modern standpoint is that monadology avoids the Scylla of dualism and the Charybdis of monism. It does so by conceiving its unit reals not as mass units but as activities, not as objects or things but as subjects. Subjective activity means that there are ideal relations, and these alone enable us to understand the relation of soul and body. The soul, whose activity is seen in its domination over the free activities of the monads which enter into the organization of the body, may itself be dominated by a higher monad and with its whole activity enter into an organization. On either side of us, above and below, our ideal nature opens the possibility of harmonious action. The universe is a composite.

64. Thus each organic body of a living creature is a kind of divine machine or natural automaton surpassing infinitely every kind of artificial automaton. For a machine made by human art is not a machine in every part of it. For example, the geared tooth of a metal wheel is not, so far as its material is concerned, artificial to us, and there is nothing in the material which denotes the special use to which the wheel is destined in the machine. But Nature's machines, living bodies, are machines even in their minutest parts and to infinity. This is what constitutes the difference between nature and art, between the divine art and our human art.

This refers to Leibniz's favourite theme of the pre-established harmony. The man-made machine is designed for a particular purpose, the material is chosen *ad hoc* and without reference to its own point of view. In the universe of monads the activities are so over-ruled that each monad in fulfilling its own life activity subserves the activity of another. In this way the whole universe is linked together in one divine purpose.

65. The author of nature has been able to practice this divine and infinitely marvellous artifice because each portion of matter is not only divisible to infinity, as the ancients recognized, but is actually subdivisible endlessly, each part into parts, each of which has some movement special to it. Were it otherwise it would be impossible that each portion of matter should be able to express the universe.

Is there then in Leibniz's metaphysical system no limit of activity, no inert material, no substratum, no irreducible matrix? Does he merely adopt an agnostic attitude and attribute our ignorance to a weakness of human reason? Is it not a necessity of thought to posit something other than activity as its foundation or support however unattainable a positive knowledge of it may be? The supreme value of Leibniz's metaphysical doctrine is in its downright rejection of this postulate. Negatively the principle of non-contradiction saves him from it, and positively the mathematical concept of infinity replaces it, and the course of scientific constructive theory has come to justify him.

That is to say, negatively the admission of the possibility of a purely inert reality would cut away his theory of substance at its root, and positively his concept of infinity forms the basis of his theory of substance as activity. Suppose he could have foreseen the vast extension of our knowledge of the physical universe would it have affected his conclusion ? Evidently not. From whatever standpoint we survey the advance of science it confirms Leibniz's leading concept. Penetrate where you will in the universe which science discloses you find a living world or at least a world which can only be interpreted in terms of life. Install yourself in the life of the world at any point and there opens around you, above and below, before and behind, an infinite immensity, the universe mirrored in you. Today for example we contemplate a stellar universe, one of a multitude of stellar universes, and we calculate the spatial distances in hundreds of thousands of light years. What is this but to imagine a living being for whom all these worlds are as imperceptible as atoms are to us ? Exactly the same holds true for the infinity below us. An electron is only the limit of physical constructive units for a living being on our plane of activity. Reduce the human proportions to the electronic plane and the electron's dimensions are cosmical magnitudes with infra-atoms and infra-electrons. In fact wherever you place yourself it is you as the subject of perceiving activity who are the real, and the objective world is your idea.

66. Thereby we see that a world of creatures, living beings, animals, entelechies, souls, exists in the minutest part of matter.

There was a widely held hypothesis which had its origin in Greek mythology and took form in various fanciful images in the Middle Ages that the earth and generally the physical world is an animated organic body. In this section and the three which follow we see that Leibniz's doctrine has nothing in common with that idea. His theory is that the appearance which matter presents to us, however minutely we divide it and isolate parts for analysis, always turns out to be a mass effect. The real thing is living activity. Even this however does not exhaust the idea. Not only is there negatively no dead limit of the universe, no inert unit of its physical basis, but also positively there is no limit at which a subjective activity would cease to function by reason of its inability to find the wherewithal to clothe its entelechy or soul with an organic body. In rejecting the absolute of space and time, in regarding space and time as a subjectively improvised order, Leibniz raises infinity from a negative to a positive value. Theology supports him with its affirmation of infinity in God and it is doubtless from this concept that his doctrine is derived. What he sees, however, is that the positive infinity of God, expressed in omniscience and omnipotence, postulates a correlative objective infinity. What is affirmed with such clearness in these sections is that just as there is no limit of divisibility in a physical reality conceived geometrically, so there is no limit of individuality in a reality conceived vitalistically. There is no point at which life ceases to be individualized and becomes undifferentiated activity.

67. Each portion of matter may be conceived as a garden full of plants and as a pond full of fish. But every stem of the plant, every limb of the animal, every drop of sap or blood is also such a garden or pond.

The principle which underlies this whole conception is that of the constancy of magnitudes for all observers and the relativity of magnitudes for all systems of reference. The entelechy of an amœba or of a white blood corpuscle is not from its own standpoint a minute activity in a minute universe with a narrowly restricted range. In endowing it with consciousness, perception or apperception, I am thereby raising its magnitudes from the infinitesimal character they appear to have to me to equality with my own.

68. And though the ground and air interspersed between the plants of the garden, or the water interspersed between the fish of the pond, may not themselves be plant or fish yet they contain them, usually of a subtlety which renders them imperceptible.

The obvious objection to the concept of universal individual activity is that by definition it is conditioned. Activity implies something active and something acted on. Individuality implies an environment and the presence therein of some reality contraposed either as inert material or as active force. Leibniz meets the objection with the idea of an *ad hoc* inertia, the effect of confused perception.

69. Thus there is nothing arid, sterile, or dead, in the universe, no chaos, no confusion, save in appearance ; exactly as a pond would appear to us at a distance were we able to see only the confused movement of the swarming fish and not the fish themselves.

This completes the image of the universe which is constituted of substantial living units with no substantial inert matrix. The conception stands or falls by its coherence and consistency. It cannot be saved by calling in aid the principle of an inactive, non-living substratum to its support. The admission of such a reality would be fatal, and so far as Leibniz is concerned there is never the suspicion of a temptation to resort to it. The great merit of this philosophy as a metaphysic of reality is its clear enunciation of the principle that activity is original and not derived. It is this which makes the old-fashioned theological garments of small consequence in comparison with the importance of its scientific significance.

70. Each living body has a dominant entelechy. In the animal this is the soul. The members of this living body are full of other living beings—plants, animals—each of which has also its dominant entelechy or soul.

We are now confronted with the problem of the way in which the entelechy dominates the organism. *Existentially* the entelechy is a monad and as such substantially distinct, separate from the body, and

independent of it. *Essentially* it is inseparable from the body for the whole meaning of its activity is the expression of its ends or purposes and these are only expressed in the actions of the body. The body on its part is not a single simple substance or monad in ideal relation to the monad which is entelechy. The body is a composite, and existentially an aggregate. More than this, the relation of entelechy to organism is repeated within the body indefinitely and holds of all its inexhaustible individual living components. How then is it possible to rationalize and represent the actualization of such a relation ? Common sense would say that if there are entelechies they must constitute a class of entities and that their presence in or absence from any group of existents is a simple question of fact. The Gordian knot cannot be cut in this direct manner. For Leibniz it is a complete misapprehension of the fact and of the problem. The essence of entelechy is the direction it imposes on the bodily actions. If there are no bodies performing organic actions, integrally controlled, responding to stimuli with co-ordinated voluntary or involuntary movements, then there are no entelechies, or at least nothing which calls for entelechy even as a hypothesis. On the other hand the organism is a closed system of movements. Every movement in the system has its mathematical equivalent, the quantity is conserved in a way which excludes the intrusion even of a directing force.

How then, does Leibniz meet the difficulty ? There is no interaction between the substance which is the entelechy of a bodily organism and the substances which constitute the existence of that organism each of which is also entelechy in its own domain. The activity of every substance, that out of which its

quality arises, is perception, and it is in perception that one substance differs from another. This implies that the relations between monads are ideal and that every monad is in ideal relation to the whole universe of monads. It is therefore by perception alone and especially by distinct perception that the entelechy influences the organism. This however gives us no more than an ideal influence. Whence comes the real influence, for there seems to be real influence, when the entelechy acts in and through the organism ? Leibniz's answer is : there is no real influence, what we interpret as real influence is the harmony of the universe. This harmony, because it is real, and because it is not brought about by external interference, and because God is not a supervisor adapting individual activities to one another from moment to moment as the needs of the occasion demand, must have been pre-established. It entered into the scheme of the creation and bears witness to the wisdom and power of God.

It is interesting to note that Leibniz's problem arises in precisely the same form in modern psychology in the attempt to define and interpret the relation of mind and body. The psycho-physical parallelism of the modern psychologist is taken direct from the metaphysical doctrine of Leibniz, with what for Leibniz was the saving feature of the theory, the pre-established harmony, left out.

71. It must not be imagined, however, as some who have mistaken my meaning seem to think, that each soul has a mass or portion of matter peculiarly its own or attached to it for ever, and consequently that it owns

other inferior living beings which are destined to be always at its service. For all bodies are in a perpetual flux like rivers ; their constituents are continually entering into them and passing out.

There are entelechies wherever there are reals and every real is entelechy. But entelechy implies the existence of an organism over which and in relation to which it is the entelechy. Moreover it is impossible to conceive entelechies detached and floating, in isolation from the bodies they animate. How then are we to represent the relation between the entelechy and the organism which is its counterpart ? It seems to be an attempt to reconcile two opposite and contradictory conceptions. The entelechy by definition both exists in itself and depends on another. Leibniz is able to overcome the apparent circularity of his argument by his concept of an actual infinite. He conceives the infinite mathematically as actually without limit, although his infinite universe is not spatial and temporal. He thinks the physical universe is inexhaustible by a finite intellect and that this inexhaustibility is only apprehensible by an infinite intellect. We must not read into Leibniz the modern concepts of " creative evolution " and " pure activity ", concepts which are attempts to meet the metaphyscial difficulty which he met with his concept of God.

This section touches on a problem which is as acute and baffling in modern theory as it was in Leibniz's day before the advance of scientific knowledge. How are we to conceive the relation of form to matter ?

There is no form without matter and no matter without form, at what point and precisely how does matter determine form and form determine matter ? If with the general trend of physical theory we resolve matter into the deformation of a structureless ether, if ultimately matter is radiation, a passing form engendered by movement, we must conclude that there cannot be material identity in the organism. Although the organism is the condition of thought, consciousness, and personal identity, it does not endure even for a fraction of a second.

For Leibniz mind and body are not two substances, one thinking, the other extended, nor are they two attributes of one substance. The mind, insofar as it dominates the body, is simple substance, individual, a monad. The body is not an opposing reality. In itself it is not substance. It is neither permanent nor real. The constituent monads of the body are themselves entelechies each dominating an organism, each the mind of a body. The mind-body relation arises not out of the concourse of monadic individuals but out of the ideal nature of the monad's activity, its perception. This ideal activity determines the composition of the universe of monads without violating the individuality of the components. In this, also, we may see an instance of the contrast, always present to Leibniz, between physical and metaphysical atoms. If the units of nature are atoms in the meaning of the old philosophy then the world is a mere multiplicity, for there is no principle of composition. Monads, on the other hand, by their ideal nature, which makes each monad a mirror of the universe, " enter into composites ", make the many one.

72. Thus the soul changes its body only gradually and by degrees, so that it is never suddenly despoiled of all its organs. And while in animals there is often metamorphosis, there is never metempsychosis, nor transmigration of souls. There are no disembodied souls, no bodiless genii. God alone is without body.

We have here the most important practical deductions from the monadic theory. First, there are no disembodied minds; second, there is no transmigration of souls ; third, God alone is pure mind without body. The last is not, as might appear by its verbal form, in contradiction with the first. " God is a spirit " does not mean that God is disembodied but that embodiment is inapplicable to God. The infinite mind has no body because it possesses adequate ideas of all existence. In the divine mind there is no region of confused and obscure perception, and it is on this distinction that the mind-body relation depends.

The whole gist of the monadic doctrine is revealed in the rejection of the notion of disembodied minds and its corollary, the transmigration of souls. These ideas belong to the common sense and scientific view of the material basis of the physical world. Living bodies are material things and are conceived as enjoying a status of their own independently altogether of the minds or spiritual substances which animate them. Bodies are inert or passive things, minds are immaterial activities. Descartes based his argument that the soul is naturally immortal on the fact that it is substantially distinct and separate from the body and

therefore not involved in the disintegration which overtakes the organism at death. The monadology bases the argument for immortality on an entirely different ground, namely, on the nature of the monads. Some monads are souls and have bodies, but the bodies are not dead material stuff which the soul animates. The body consists of monads and the soul is the dominating monad. Each of the dominated or subservient monads in its turn has its own range of domination. A disembodied soul therefore would be for the monadic theory a self-contradiction. It would be an activity cut off from its perception, a thinking cut off from its thought. The logical basis of the monadic conception is the impossibility of defining existence except in terms of activity. Anything is what it does. Therefore to separate being from doing, thinking from living, mind from body, body from mind, and endow each with an independent substantial reality, is on the monadic principle a *reductio ad absurdum*.

73. It follows from this that there is neither absolute birth nor complete death in the precise meaning of the separation of the soul and body. What we call *births* are developments and unfoldings, and what we call *deaths* are foldings and shrinkages.

Leibniz here is clearly dominated by the concept of the nature of an organized living thing which the microscope seems to have suggested to him. The development of an organism, plant or animal, is the opening out of what lies already there, dormant and

folded up. Death, he suggests, is the reverse process. He cannot have had microscopic confirmation of this, but the analogy is natural and the argument is supported by the Christian doctrine of the resurrection of the body.

74. Philosophers have been very embarrassed hitherto in their attempts to account for the origin of forms, entelechies, or souls. Today however, exact researches on plants, insects and animals have come to establish the fact that natural organic bodies are not spontaneously produced from a chaos or from putrefaction but always from seeds or germs. In these seeds there can be no doubt there is already some *preformation* before their germination. It has been conjectured indeed in the case of the animal that not only is the organic body already existent before conception, but even that there is a soul in this body, and in a word that the identical animal actually exists before conception. Conception is a means of a great transformation of disposition which makes it become an animal of another kind. We see indeed something very closely approaching generation when maggots turn into flies, caterpillars into butterflies.

Leibniz uses the term conception here in its technical physiological meaning to denote a stage in the progress of uterine fœtal development. The idea of preformation is a very old one and enters largely into the mythology and philosophy of the ancient world. Unfortunately we know today as little as Leibniz knew how and at what stage of the fœtal life the individual principle or entelechy takes form and enters on its work. The metaphysical doctrine, which he supports by these reflexions on the development of the embryo, is that every monad came into being with the creation of the universe and can only go out of existence with the annihilation of the created universe.

75. There are therefore two orders or grades of animal existence. First, the animals which by means of conception rise from the lowest to the highest grade: they may be distinguished by the term *spermatic*. Second, those which remain in the *lower* grade and never rise above it. These, which are overwhelmingly the greater number come to birth, multiply, are destroyed, just like the animals which rise to the higher order, but they remain on the lower stage. Only a very small elect number passes upward to the great stage.

The preformation hypothesis, which was very attractive to thinkers in the seventeenth century, has ceased to be scientifically tenable, yet the arguments which Leibniz based on it are easily adaptable to modern

theories of evolution and to the facts of heredity. In this section he seeks to explain a simple consequence of the preformation theory, namely, how it is that so many, indeed the vast majority, of fully constituted individuals never get the chance to play their part, and what governs the selection of the select few. In the case of plants, only a very few out of a vast number of fully potential individuals actually reach the stage of germination, growth, flowering, fruiting; and in the case of animals there are vast numbers of germs—ova and spermatozoa—live and die unfertilized, without the stage of conception or any passage to the higher life of the organic living being. It follows that there is in nature a hierarchy of opportunities as well as a hierarchy of activities. The prodigality of nature is amazing. What Leibniz emphasizes is that the individual life which plays its part in the world, that is, the individual animal of a species born to an independent life, does not date its existence from its birth, or even from conception in the womb. It has no actual beginning other than the act of creation which brought the universe of monads to existence.

76. In this however we have no more than half the truth and I am led to the conclusion that if the animal has no natural beginning it can have no natural end. Not only is generation impossible but equally an entire destruction. There is no death in the absolute meaning. The *a posteriori* arguments based on experiments which lead to this conclusion agree perfectly with my principles deduced *a priori*.

The *a priori* principles to which Leibniz refers are those which establish the indestructibility of the monad as simple substance. The *a posteriori* arguments are those which conclude that the organic individual is preformed in the ovum. The preformation theory makes it impossible to fix any point of development as an absolute beginning, and equally makes it impossible to fix any point as an absolute ending. If birth is not a natural beginning death is not a natural ending. The argument is not a special plea for the immortality of the soul, it is rather an expression of satisfaction that ordinary empirical facts accord with the metaphysical principle of the pre-established harmony.

77. We are able to say then not only that the soul (mirror of an indestructible universe) is indestructible but the animal itself is indestructible although its machine often perishes in part as it puts on or takes off organic wrappings.

Leibniz is preparing to develop his metaphysical doctrine on the finalistic side. The realm of ends which is now coming into view must be based on clear and distinct ideas of the nature of the reality of the universe.

78. These principles enable me to offer a natural explanation of the union of soul and body, or, as I should rather say, of the conformity of the soul with the organism. The soul

obeys its own laws, the body also its own, and the two accord by virtue of the pre-established harmony between all substances since all are representations of one and the same universe.

It appeared to Leibniz that the relation of mind and body could only be one of three possibilities. These are: direct action of one on the other; continuous adaptation of one to the other; and pre-established harmony between the two. The first was rejected in Leibniz's day on metaphysical grounds, and it is rejected today by those who reject it on scientific grounds. An action of mind on matter, or matter on mind, is impossible to conceive, and as matter of fact is inexpressible in any mathematical equation. The second requires as its postulate the continuous and uninterrupted activity of God. It was advocated in the seventeenth century by Malebranche and the occasionalists. The third also presupposes the intervention of God but identifies the relation with the unique principle which underlies the creative work itself. " Conformity " much better than " union " expresses Leibniz's idea of this relation. The various organs of the body and their different functions are unified in a quite different meaning to that in which soul and body conform in one activity. The soul is an organization of spiritual experience obeying its own laws, the body is an organization of mechanical movements quantitatively compensated. Ultimately there is only one principle on which the whole universe holds together and that is the principle by which every real constituent activity mirrors in itself the one and identical universe

of which it is a constituent, and in this way ideally represents in itself all the other activities. It is this principle which makes every monad dominant within a certain range and sphere. It is the ideal relation alone which makes the universe one. The mind-body relation accordingly is a relation of end to means, of finality to efficiency. It enables the entelechy to find expression and to do work, but it is a kind of *imperium in imperio*, not fundamental like the relation which makes each monad a mirror of all.

To give full expression to Leibniz's thought we should have to deny the existence of the body in the same meaning in which he denied that there are things. The body is no more than the transient shape and passing form which gives expression to the activities of the soul. In itself the body is neither one, nor spatial, nor temporal ; it is a many, a composite without real relations, its spatio-temporal appearance is the expression to others of the activity of the dominant entelechy for which alone it exists as body or instrument of activity.

From this we may see why pre-established harmony is so essential a part of Leibniz's scheme. No monad is or can be coerced by another. The sort of relation therefore which brings about action and devises means to end, must be conformity and conformity can only follow from understanding. This is the ground of Leibniz's intellectualism.

79. Souls act in accordance with the laws of final causes by appetitions, ends and means. Bodies act in accordance with the laws of efficient causes or movements. The two

realms, the realm of efficient causes and the realm of ends are harmonized together.

The well known illustration Leibniz used to express his idea of the nature of the relation of the mind to the body—the two clocks of the skilful clockmaker so consummately designed that without requiring supervision the state of one would always indicate the state of the other—although it serves to explain what is meant by psycho-physical parallelism is misleading if taken as a complete account of the matter. The body, which is independent of the mind at the same time that there is point to point correspondence between the two activities, is not one thing but many things, and the composition of the many is not invariable but changing continually, and yet in relation to the mind the body acts as one. It is not however the monads which compose the body but the relation of these monadic activities to the activity of the mind which constitute the body a unity. The body is a unity because in exhibiting the laws of efficient causation or movement it carries out the ends of the mind, the mind exhibiting the laws of final causes.

We may therefore sketch for ourselves a much more complete idea of the scheme of monadic activity in the mind-body relation if instead of two clocks made by a skilled artisan we take as illustration an institution or corporation such, for example, as a bank. In such a business organization the governing body will stand for the mind and the various officials for the body. The banker, we shall say, in Leibniz's words " acts in accordance with the laws of final causes " ; the various officials, the cashiers, the book-keepers, the discounters, the checkers of securities, act collectively

" in accordance with the laws of efficient movements ". In the institution every individual member has his allotted task and his definite range of activity, and these though vital to his individual position and his personal interests yet concern the bank and the efficient carrying out of its purposes, which may exist only in the activity of the management. This gives us a fairly complete example of the mind-body relation, in illustrating how independent individual activities, in, and through, and by means of, a dominant directing activity, take a form which, without destroying or even invading the free composite individualities, issue in a common function. Here however we may imagine someone to object that it is not the staff of officials but a certain material structure which stands for the body of the organism. The bank, it will be said, with all its complete staff of officials cannot effectively work without an office for the transaction of its business, a strong room for the safe custody of securities, with all the accompanying accessories. It is true enough, we admit in reply, that the bank involves these material accessories but so far as the analogy goes they no more correspond to the body of the living animal or are essential to the bank's business, than the clothes a man wears or the tools he employs are identical with his living body. The relation of mind and body is a quite distinct problem however it may seem to involve the general problem of the status of the material world and the physical law of the equivalence of action and reaction.

80. Descartes held that souls do not impart force to bodies, on the ground that the amount of force in matter is a fixed quantity. He

thought however that the soul could change the direction of bodies, for in his time the law of nature that the direction of the movement of bodies is conserved was unknown. Had Descartes been aware of this he might have chanced on my system of the pre-established harmony.

Descartes held that the body is an automatic machine and the principle of a machine is the conservation of force. Force, he held, consists wholly of movement which accordingly must be constant in quantity. To suppose therefore that the soul imparts force to the body, increasing or decreasing the amount of movement, is directly to contradict the principle on which the physical world is unified. Descartes supposed however that the soul might influence the body by directing or guiding the force already possessed by the body. Had he seen the significance of the first law of movement, that a moving body can only be changed in direction by force, he would have had no alternative but to regard the inclinations of the soul and the adaptations of the body as independent of one another, and their correlation as the result of a pre-established harmony.

81. The pre-established harmony is the system according to which bodies act as though (*per impossibile*) there were no souls and souls act as though there were no bodies; and together they act as though they influenced one another.

It is impossible there should be no souls because souls are the simple substances of which the universe consists and therefore were there no souls there would be no bodies. Bodies are composites, and the simples of which composites consist are the monads. All the monads are not souls, but souls only differ from simple monads by their position in the hierarchy. The reason why there can be no interaction between mind and body is not because they are substantially different but because the monads which constitute the reality of the body do not give it the status of the body. It is only for the dominant monad or mind that the body is body, the mind therefore could only act on the body by acting on the monads which constitute the body, and there is no interaction between monads.

Leibniz is preparing to present his doctrine of the principle of continuity in the universe in his concept of the supreme monad. The only real bond between the monads is God on whom they depend. This dependence on God is not merely the efficiency implied in their creation but the finality in realizing God's end. God's relation to the created monads is that of the dominant monad or mind to the body. God realizes his purposes not by coercing or violating the natures of his creatures but by overruling their independent activities to the fulfilment of an end of his own.

82. There is a peculiarity in regard to minds or rational souls. While it is fundamentally true of animals and all living things that their beginning is with the beginning of the world and that they last as long as the world, yet rational animals have this character

that the rational soul is not in them from the first. The infinitesimal animals which they generate in the sperm, while they are spermatic animals only, have simple ordinary or sensitive souls, but when the elect among them, as we say, attain, by actual conception, their full human nature, then their sensitive souls are raised in dignity to the prerogative of minds and become rational souls.

This curious idea is a corollary of the preformation theory. It has its counter problem in modern biology. Myriads of individuals each with the potentiality of rational souls exist in the universe. Not only, in Leibniz's theory, is the whole progeny of Adam preformed and existent in Adam when he is created, but an immensely vaster number of monads, each with the full possibility of maturing as an individual. Moreover we must suppose all these infinitesimal bodies to exist with their animal souls, and from them a select few become rational monads in the distinctive meaning. Doubtless Leibniz saw in this Principle of Nature an analogy with the Principle of Grace. Many are called and few are chosen, and the overwhelming majority are not even called.

83. Among all the differences between ordinary souls and rational minds which I have been noticing the chief is this. While souls in general are living mirrors or images of the universe of creatures, rational minds are images of the creator himself, the divine

author of nature. Rational minds are capable of knowing the system of the universe and to some extent imitating it by architectonic patterns. Every rational mind is as it were a little divinity in its own department.

We now come to the completion of the metaphysical scheme. The full implication of the argument is that what we may learn by studying our own relation to the universe shows us also the relation in which we must ourselves stand to the supreme monad. The ideal bond which unites the free active constituents of the universe into a harmonious system not only embraces our human relations of mind and body, spirit and matter, agent and sphere of activity, but also shews us our own free spirits dominated and overruled by the supreme spirit, in such way that God's ends are fulfilled in our self-originated, self-directed actions. The relation of mind to body, the relation of the dominant monad achieving its ends without interfering with the subservient activities which provide the efficiency, typifies the relation in which we stand to one another as members of the human society, and the relation in which we may stand to God who fulfils his ends by means of free spirits fulfilling their ends.

84. This is what makes rational minds capable of entering into a kind of society with God, so that to them God is not as an inventor to his machine (this being his relation to his other creatures) but as a Prince to his subjects, and even as a Father to his children.

Throughout the monadology Leibniz has taken the discursive nature of reason for granted, and presents no special theory of it. Intercourse he seems to regard as fact and its possibility is not for him a problem. The modern interpreter however meets with a difficulty at once when he tries to reconcile the insistence on the non-interaction of the monads (which have neither doors nor windows) with the assumption of an interchange of ideas by means of impressions on the organs of sense.

The passage before us clearly means that as reason is in its nature discursive, and as rational minds are capable of intercommunication, so there is for them the possibility and evidence of the actuality of intercourse with God. Our relation to the Supreme Being is not merely that of rational monads to one another. We belong to a society over which an invisible Prince presides, or to a family of which a Father stands at the head. It is our rational nature which enables us to communicate with God and to receive from him the direct revelation of his will.

85. We are led to conclude that the assemblage of all rational minds is the City of God. It is the most perfect state possible under the most perfect monarch.

Observe that Leibniz conceives the City of God as a true universal. It is not as it was for St. Augustine the church in separation from the world ; it is not a kingdom of heaven confronted by an opposing kingdom of darkness. The idea is essentially metaphysical, whatever theological significance it may have.

The fundamental character of the system of the pre-established harmony is that everything in the world, every constituent monad, is an essential and necessary part of the whole. The City of God is thus in a way what in contemporary philosophy is termed the Absolute, the reality transcending individual experience in which all contradictions are reconciled. It involves therefore the idea that evil—physical and moral—is negative. Evil does not exist in its own right. It has not to be cast out that good may triumph, and it does not set up for itself an opposition.

86. This City of God, this really universal monarchy, is a moral world in the natural world. It is what is noblest and divinest in the works of God. In it God's glory really consists, since there would be none were his greatness and goodness not known and admired by rational minds. It is also relatively to this divine city that there is goodness in the strict meaning, that is, something other than wisdom and power which manifest themselves everywhere.

The natural world and the moral world are not numerically two nor are they in the relation of part to whole. Just as the attributes wisdom, power and goodness, do not exist apart in the divine essence, so the moral world does not exist apart from the natural world.

87. We have already seen that a perfect harmony exists between the two natural realms, the realm of efficient causes and the realm of final causes. We have now to shew another harmony between the physical realm of nature and the moral realm of grace, that is to say, between God considered as architect of the machine of the universe and God considered as Monarch of the divine city of rational minds.

The term "grace" is not used here in the strict theological sense although it is from the theological doctrine it derives its meaning. Leibniz does not confine it to the immediate work of God in the individual soul, but identifies it with the general moral realm. It is not the concept of a scheme of salvation by which some are elect and some reprobate, it is the general scheme of a world in which final causes are the correlative and counterpart of efficient causes.

88. This harmony makes things lead to grace by the ways of nature, and shews us, for example, that the earth must be destroyed and renewed by natural ways when the government of minds requires it, for chastisement in the one case and reward in the other.

The thought here is profound, and reveals to us the key idea in Leibniz's mind. The natural world is not the stage on which the moral drama is played, and the

mechanism of that world is not interfered with as occasion requires to inculcate moral lessons. On the contrary, what we from our finite standpoint see in the moral world is the fuller and higher expression of the final end of the author of nature, while what we see in the natural world is the efficient cause by which the final cause is actualized. Yet the two worlds are not different aspects of one and the same world, rather are they partial views. Let us take for example the illustration which Leibniz has followed out in the *Théodicée* (405-417). It is the story of Tarquinius Superbus, the last of the Roman kings. We see the havoc and waste in the natural world, the sin and presumption in the moral world, and both, it seems to us, could have been left out of the creative scheme to the advantage of a world which in each aspect, the natural and the moral, would then be better than it is. To the extent however to which we can rise to a complete view we see the two sets of conditions mutually righting one another, even to the degree that we are able to say, it would be a worse world and not a better from which Tarquinius and the consequences of his usurpation should have been excluded. The master theme in Leibniz's speculation is that God works, not mechanically and piecemeal, but with the whole scheme present from the beginning so that the harmony of the created universe is complete in its inception and not waiting for its far off end.

89. We may say indeed that in everything God the architect accords with God the law-giver, and thus that sins carry their penalty with them in the order of nature, and even by

reason of the mechanical structure of things, and likewise the noblest actions draw forth their reward by ways which are mechanical relatively to bodies, although the result may not, and often does not, follow straightway on the action.

God the law-giver stands to God the architect as the mind to the body. The mind wills, the body gives the will efficiency. Mind and body seem independent, yet purposes are ineffectual without actions. The finality of mind is nothing apart from the efficiency of body. The universe taken as God's creation is a realm of ends and a realm of ends is unactualizable without efficient means. Existentially therefore finality and efficiency are identical.

90. Finally, under this perfect government, no good action goes unrewarded, no evil action unchastized. Everything works for the success of the good ; that is, of those who are not dissatisfied in this great state, who trust in providence after having done their duty, and who love and imitate to the best of their power the author of all good, delighting in the thought of his perfections, following the lead of that " love undefiled " which takes pleasure in the happiness of what it loves. It is what leads the wise and virtuous to work for that which appears to conform to the presumptive or antecedent will of God,

> and yet to be content with what God brings to pass effectively by his secret, consequent and decisive will. It leads us to recognize that were we able to understand sufficiently the order of the universe we should find it surpass our wisest wishes, and see that a better world than the world which is could not be. Not only is the world the best possible for all in general, it is the best possible for us in particular, if we are attached as we should be to the author of all, not only as architect and efficient cause of our being but also as our Lord, the final cause who should be the only goal of our will and who alone can make our happiness.

The Monadology is now seen to be a theory of metaphysical optimism. The world is the best of all possible worlds, not in the meaning that it is the best under the circumstances, or that it possesses a clear balance of good over evil, or that the choice is between necessary evil and no world at all. It is best in the absolute meaning. We may see in it the expression of perfect wisdom, perfect power, and perfect goodness. Evil is not explained away, either in the physical meaning of pain or in the moral meaning of sin, nor do pain and sin lose their character, nor are the free individual agents relieved of responsibility for evil. But just as the living organism is valued for the end it serves in the rational life of the individual creature and not for the conflicts and disorders and restrictions which characterize the multitudinous activities of its

constituent parts, so the universe is valued for its individuality and not for its constituent individuals.

Thus the Monadology which begins with the concept of the monad as a simple substance and constituent unit of the universe closes with the concept of the City of God as the embodiment of the principle of the pre-established harmony. A study of Leibniz's early writings shews that the order in which he conceived his ideas was the reverse of this. The idea of the system led him to the definition of the monad and the concept of its nature. The pre-established harmony seems to have occurred to him early in his philosophical reflexion and to have been excogitated by him as a possible way of interpreting the relation of God to the universe. The problem in its first form was theological and doubtless had reference to the controversy then troubling the peace of the church, the problem of free-will versus grace, whether it was for all men or only for the elect that Christ died. It raised however a more fundamental problem for the philosopher, that of the creation of free spirits with its consequence in the existence of evil and sin. The very idea of harmony presupposes the clash of private ends. Take any work of art—a symphony, a landscape, a building —and break it into its constituent parts, you have only opposition and conflict, inconsistency, stresses and strains. The harmony is not an outcome of the assemblage of the constituent units. It is pre-established. It represents the final cause for which the constituent units are the efficient cause, and is related to them as the end to the means.

III

LEIBNIZ'S ELUCIDATIONS OF THE THEORY OF MONADS

I

THE ORIGIN OF THE THEORY OF MONADS

Leibniz's account of his philosophical development in a letter to Nicolas Remond, July 1714.

My chief concern has always been edification, but I have sought continually to disinter the truth which lies buried beneath the opinions of the different sects and also to reunite the knowledge dissipated by them, and in doing this I think I have been successful in contributing something of my own towards a new advance. The occasions of my studies from my childhood onwards have provided the means. I learnt my Aristotle when a child. I was not repulsed by the Scholastics even then, and I certainly do not regret it now. Also while still quite young I took delight in Plato and Plotinus, not to mention other ancient philosophers whom I read somewhat later. When I came to know the moderns I soon emancipated myself from the trivialities of the Schoolmen. I can well remember walking by myself in a wood near Leipzig, named Rosendal, when only fifteen, and deliberating whether I should give up Substantial Forms. It was then that mechanism took hold of me and led me to apply myself to mathematics. It was not till much later, not in fact till after I had met

Huyghens at Paris, that I devoted myself deeply to that study. When, however, searching for the basis of mechanism I came to study the laws of movement, I discovered to my surprise that it was impossible to derive these laws from mathematics and that I must go beneath mathematics to metaphysics. This brought me to Entelechies, and led me from the material to the formal, and made me understand at last after several corrections and progress in my notions, that the Monads or simple substances are the only real substances, and that material things are phenomena, however well-founded and interconnected they may be. Plato and also the later Academicians and the Sceptics had glimpsed this truth, but the successors of Plato did not make such good use of it as he had.

I have found generally that the Sects are for the most part right in what they affirm and wrong in what they deny. The Formalists, both Platonists and Aristotelians, are right in seeking the source of things in final and formal causes. They are wrong in neglecting efficient and material causes, and inferring, as the English philosopher Henry More and other Platonists do, that there are some phenomena which cannot be mechanistically explained. Yet on the other hand the materialists who regard philosophy as wholly mechanistic, are wrong in rejecting metaphysical

considerations and attempting to explain everything by what depends on the imagination.

I flatter myself that I have succeeded in penetrating to the harmony of these different realms. In my view both sides are right so long as they do not clash. All the phenomena of nature proceed mechanistically and metaphysically but the source of mechanism is not metaphysics. To unravel the mystery was no easy matter since so few will take the trouble to unite the two kinds of study. Descartes did so but fell short. In most of his dogmas he proceeds too rapidly. His philosophy may be called the antechamber of truth. The greatest hindrance to his progress was his ignorance of the true laws of mechanics and movement. Huyghens was the first to perceive these though even he fell short through his distaste for metaphysics, in common with so many other clever men. I have remarked in my book (*Théodicée*) that had Descartes perceived that the laws of movement require the conservation not only of force but also of the whole direction of force, he would not have been led to attribute to the soul the power to change the direction of a force without the power to exercise it, and he would have been led straightway to my system of Pre-established Harmony, for that is the necessary consequence of the conservation of both force and direction.

II

AN ELUCIDATION CONCERNING THE MONADS

This elucidation appears to have been written by Leibniz to be enclosed in the foregoing letter to Nicolas Remond, containing the account of the origin of the Theory of the Monads, but withheld. In this letter, dated Vienna July 1714, *he says he had hoped to enclose an Elucidation concerning the Monads (Éclaircissement sur les Monades) but the matter had grown in his hands and so many distractions had interfered with its completion that he must hold it over. Writing again from Vienna a month later (August* 26*th* 1714) *he refers to the former letter and says that he is now sending a short discourse which he had prepared for Prince Eugene. It seems therefore that a copy of the Monadology was sent and this Elucidation laid aside.*

I have heard from Monsieur Hugony that you are finding some difficulty in regard to my Unities or Monads. I would like to know what your difficulty is but meanwhile I will try to explain myself. I believe that the whole universe of creatures consists of simple substances or Monads and their assemblages alone. These simple substan-

ces are what in ourselves and in the genii we call mind, and in the animals, soul. All have *perception* (which is nothing more than the representation of the multitude in the unity) and *appetite* (which is nothing more than the tendency of one perception towards another) and this appetite is called *passion* in animals and *will* wherever perception is understanding. We cannot even conceive anything else in the simple substances and consequently in the whole of nature. The assemblages are what we call bodies. What appears passive and uniform and resisting in these bodies, in the mass, we call matter; but the primitive active force is what we call Entelechy, and it is in this that the mass is varied. These bodies, with all the properties we attribute to them, are not substances but well-founded phenomena, the ground of appearances, different for different observers. These appearances are related, inasmuch as they have the same ground, like the different appearances of one and the same city viewed from different standpoints. Space far from being a substance is not even an entity. It is an order, like time, an order of coexistences just as time is an order between existences which are not compresent. This continuity is not ideal but real, for it consists in this order. In ideal continuity the whole is anterior to the parts, just as the arithmetical integer is anterior to the frac-

tions into which it can be divided and which can be arbitrarily assigned to it, the parts being only potential ; but in real continuity the simple is anterior to the assemblages, the parts are actual, they are before the whole. These considerations raise difficulties in regard to continuity, when it is assumed that the continuous is real, and has parts previous to any division, and that matter is a substance. Extension is not to be conceived as a real continuous space with points scattered over it. Such conceptions are fictions, which may satisfy the imagination, but of which reason cannot take account. All the more must we not conceive the monads as points in a real space, jostling, pushing or touching one another. Phenomena do indeed make them so appear and this appearance has truth so far as phenomena have a ground, that is, insofar as they admit this appearance. Movements and concurrences are only appearance, but an appearance well founded which never belies itself, like a dream which is precise and persistent. Movement is the phenomenon of change according to place and time, the body is the phenomenon which changes. The laws of movement, being founded in the perception of the simple substances, come from final causes or from convention and these are immaterial and private to each monad. If matter were substance these laws would be derived from natural reason or from geometrical necessity

and then would be quite different from what they are. There is no action of substances other than perceptions and appetitions, all other actions are phenomena as are all other actings. Plato seems to have held a similar view, for he considered that material things had little reality, and the Academicians challenged the whole idea of external reality. Material things can be rationally explained consistently with the view that there is nothing outside our perceptions and that they therefore have their reality in the agreement of the perceptions of the apperceiving substances. This agreement is due to the pre-established harmony in these substances, for each simple substance is a mirror of the same universe, as durable and as ample as it, although perceptions of creatures can only be distinct in regard to a few at a time. Also they are diversified by their relations or rather we may say by the different viewpoints of the mirrors. This brings it about that one and the same universe is multiplied in infinite ways, each living mirror representing the universe in its own way. We may say, then, that each simple substance is an image of the universe, and over and above this that each mind is an image of God. For minds are not like souls, without reason, empirics, having knowledge only of facts and relations ; minds have knowledge of the necessity of the eternal truths, are able to understand the reason of facts,

and can imitate the architecture of God. They are also able to enter into society with God, into fellowship in the City of God, the most perfectly regulated state possible, even as this world also is the most perfect of all constructions, the best in its physical and the best in its moral composition.

I fear lest this letter, full of abstract thoughts remote from anything we ordinarily imagine, may repel you. I do not even advise you to meditate too long at a time on it, to revert to it would be better. I want to shew, however, my respect and esteem by writing to you what I would not easily be persuaded to write to another. Please regard this letter as for yourself only. To the general it might appear absurd or unintelligible.

III

ELUCIDATIONS
OF
THE REFORM OF THE ONTOLOGICAL ARGUMENT; THE DEFINITION OF MATTER; THE THEORY OF THE PRE-ESTABLISHED HARMONY; AND THE NATURE OF FREE-WILL

In the years 1702-1706 *Leibniz was corresponding with Isaac Jacquelot, Pastor of the Reformed Church of the French Colony in Berlin. These elucidations are direct replies to questions submitted by Jacquelot. It will be seen by the date that they antecede the Monadology*, 1714, *and also The Theodicy*, 1710.

I

REFORM OF THE ONTOLOGICAL ARGUMENT

Descartes's Argument for the Existence of God assumes that the all-perfect being, or the necessary being, is possible. The argument comes to this: the all-perfect being includes in its idea among other perfections that of existing necessarily; or, the all-perfect being is a necessary being. Now the necessary being exists; therefore, the all-perfect being exists. It is as though one

should reason thus: The necessary body is a necessary being; necessary being exists; therefore the necessary body exists. To this my only reply would be that this argument assumes that the necessary body is possible, just as the other assumes that the being which includes all perfections in its essence and especially existence, is possible. It would be exactly the same if for necessary body we substituted all-perfect body.

We can see at once that a conclusion so important as that of the existence of God cannot be so hastily reached and that something must be added. This confirms me in what I have said elsewhere concerning the abuse of the doctrine of ideas. (Definitions are not arbitrary as Hobbes maintained and we cannot form ideas at will, though the Cartesians seem to hold that we can. The ideas we claim to form must be real, that is to say they must be possible, and the ingredients we put into our ideas must be mutually compatible). It is only by the abuse of ideas that we can deduce, for example, from the definition or idea of infinite (*extrème*) velocity that the part is as great as the whole. The only way of rejecting this conclusion is to deny that infinite velocity is possible, or that it is a real idea. All our reasonings imply the reality of the ideas or, what is the same thing, their possibility. Geometricians have always understood this, for they have made it a

postulate. Thus Euclid postulates at the beginning that a straight line is possible : *a puncto ad punctum duci posse rectam.*

Yet Descartes's argument, and St. Anselm's before him, is not the sophism which so many think it. In my view it is a good argument though imperfect and what it lacks can be supplied. But even as it stands, imperfect and with nothing added, it has considerable value insofar as it proves that the divine nature enjoys at least this privilege that it needs only possibility or essence in order to exist. What is more, the argument gives at least presumptively the existence of God, for all existence must be thought possible in the absence of proof to the contrary, until, that is to say, we are made to see that it is impossible. This *presumption*, as we may call it, is incomparably higher than a simple *supposition*, since most suppositions must be proved before they can be admitted, while whatever is presumed must pass as true until it is refuted. The existence of God therefore has the presumption in its favour, since it only need be possible. Now possibility is always presumed and must be held true until impossibility is proved. This argument accordingly has the force that it lays the *onus probandi* on him who denies it, and since no one can prove its impossibility we must hold God's existence to be real. Should we wish, however,

to make the demonstration absolute in the manner of geometry we must give the proof of the possibility which it requires. I have tried to contribute such a proof by making it evident that if the necessary being, were impossible all the contingent beings would be impossible also, and so nothing would be possible. For since contingent beings have not in themselves the sufficient reason of their existence they must have recourse to the necessary being, which is *ultima ratio rerum*, the final ground of things.

II

THE DEFINITION OF MATTER

1. Matter (by which I mean not primary matter but secondary matter or mass) is not a substance but substances, such as a flock of sheep and a pond full of fish. Corporeal substances, in my view, are only nature's machines with souls or something analogous without which they would have no real unity.

2. Every created substance acts and suffers. There is nothing contradictory in this. [Jacquelot had argued that it is a direct contradiction.] I hold that nothing whatever exists apart from matter. The ancient philosophers gave bodies to genii and the Fathers give bodies to angels. God alone, who is pure act, is exempt from matter.

3 There are two kinds of force in the body, a primitive force which is essential to it (ἐντελέχεια ἡ πρώτη) and derived forces which depend on other bodies. The derivative or accidental force, which we have to attribute to bodies in movement, is a modification of the primitive force, just as the shape of the body is a modification of extension. Accidental forces could not exist in a substance without essential force, for accidents are only modifications or limitations and cannot include more perfection or reality than the substance.

4. Movement is not the cause but the effect or the consequence of force. Movement, moreover, is not a being any more than is time, it has no coexistent parts and consequently does not exist. Force, on the other hand, is subsistent and can endure. Moreover it is the same quantity of the force from which movement is derived, and not the same quantity of movement, which is conserved in nature. Force, being instantaneously available, makes the momentary difference between a body in movement and a body at rest or in least movement.

5. You claim to prove that movement is not essential to matter and you assume that you are in agreement with me when you say that a body

may be absolutely at rest. [Jacquelot had written : Were movement of the essence of a given body A, it would be impossible for me to think of A at rest. Now I can conceive A at rest, and so definitely that when I suppose A to be the point at which the body B begins to move, I necessarily suppose A at rest in order to determine B's movement. This is so true that even if A is actually in movement I must pay no attention to its movement, I must even suppress the idea of it, and this I could not do were movement of its essence.] But I hold that a body without action and movement is as unacceptable in nature as a space without matter. Every body suffers something from surrounding bodies and this could not be without receiving movement. I agree, however, that a body by itself could not act, for it could not come to any determination ; but a body could not exist alone. I agree also that in pure matter without primitive entelechy there could be no action.

6. You ask me whether the degree of movement the body has is essential to it. I reply that the essential force of the body goes to infinity (*à l'indéfini*) but it is limited by the concurrence of other bodies which produces a definite movement.

7. When mathematicians assume rest, it is in the same manner as they assume perfect circles, which yet are never found. Rest is ideal and serves like the circle for reasoning. Practically we say there is rest when no movement is sensed. Just as rest can be conceived relatively when the movement is very small in comparison to others, so bodies which maintain the same distance between them are relatively at rest though together in movement. So too the whole may remain in its place while there are internal movements of the parts. It is unnecessary to refer to many other uses of the idea of rest.

8. I am, I think, in fundamental agreement with you when you say that it is mind which acts and matter which suffers. In every corporeal substance I conceive two primitive powers, to wit, first, entelechy or the primitive active power which in animals is soul and in man is mind, and in general is what the ancients called the substantial form ; and second, primary matter or primitive passive power which makes resistance. It is therefore, strictly speaking, entelechy which acts and matter which suffers, but neither without the other is a complete substance.

9. I also agree that in a certain sense the mind draws everything from its own source, or rather

that this is true of every simple substance and of every unity, as I have shewn elsewhere in explaining the union of the soul and the organic body.

III

THE PRE-ESTABLISHED HARMONY

1. I hold that the soul has received from God the power of producing its own thoughts. The Cartesians themselves I think admit this in regard to some thoughts. I think so in regard to all. And though indeed in my system the nature of each substance consists in active force, that is in what makes it produce changes according to the laws of its being, yet it is true that God concurs in everything by the continual conservation of beings. (And it is because God is the common cause that all substances harmonize. My system is a new proof of God's existence, a proof which at the same time demonstrates the wisdom of God beyond any concept of it expressed hitherto. Bayle has recognized in his Dictionary that my system easily gives a higher idea of this attribute.)

2. The soul produces its thoughts in the presence of corporeal ideas and not by their aid or influence. I should be glad to find the system of occasional causes explained in a way which would make it agree with mine.

3. The soul is excited to new thoughts by its internal object, that is, by its precedent thoughts. For there is a succession or connexion between thoughts as there is a succession or connexion between moments of time. The marvellous thing, the miracle, is that each substance is a representation of the universe from its own point of view. It is to attribute to creatures and to the work of their creator the greatest richness and the highest perfection possible. There is a reduplication of worlds in these countless mirrors of substance and thereby the universe is varied to infinity. All simple substances are, as it were, small divinities respectively to one another, from their beginning, for as to their end, they have none.

4. The reason children do not think the thoughts of adults is because their thoughts are parallel with the external phenomena relative to their body. It is the consequence of harmony. Souls, however, are never inactive, never without thoughts, however confused and obscure the thoughts may be when the phenomena contain nothing clearly distinguished and in relief.

5. This natural harmony of the thoughts in the mind with what is going on in the organs is also the cause of the apparent derangement of

thoughts, although ultimately and in the whole succession of things nothing is absolutely deranged. The greatest disorders are corrected and recompensed with usury in this succession of things.

6. The unteachableness of some people is likewise due to this relation, for there is nothing in the soul which is not also expressed in the organs. No two souls are ever perfectly alike and all are different at the beginning. For each soul is made to represent the universe in its own manner. A Hottentot is not Monsieur Descartes, nor Alexander the Great.

7. When sounds are not clearly distinguished the reason is that other objects which are more distinct occupy our attention and block them. Whatever is morbid in us and marks some imperfection, as, for example, the slowness of our progress in knowledge, has its reason in the organs. Insofar as we are passive and imperfect God in regulating the universal harmony has fitted us to other things, and insofar as we are active and have some perfection God has fitted other things to us. We are not to suppose, however, that the small unnoticed things which strike us are bodies lost. Nothing is lost and everything which happens to us enters into what will happen.

8. There is always something in our imagination corresponding to our ideas even to our ideas of immaterial things, for example the signs we use in arithmetic and algebra and their names.

IV

THE NATURE OF FREE-WILL

My hypothesis is not inconsistent with freedom. On the contrary, more than any other system, it affirms true freedom, that is to say, spontaneity with choice and the soul's independence of everything save God alone. There is in things a greater inclination towards what is going to happen than to any other event, but this imposes no necessity. For although this prevailing inclination serves to predetermine the future, and in fact everything is in this meaning predetermined, yet is it always subject to the contingency in things and to the freedom in minds. The pre-established harmony requires no more. To come now to your actual objections :—

1. If the ideas which the soul must have in the course of time are all enveloped within it at the first moment of its creation, what freedom can there be in a thing done in the doing of which the soul had no concurrence in the ordinary meaning ? *Habuit se ut merum subjectum et mere passive.* I reply : Firstly, that although the

future is enveloped in the soul, the soul is none the less free, because the future is in God's understanding and God's understanding does not deprive the soul of freedom. Secondly, that future things are enveloped in the soul but not in the full meaning in which they are in God, because they are in the soul only in a confused fashion which produces inclination and not in the express and perfect fashion of the divine ideas. And thirdly, that though doubtless the soul has no concurrence in its original constitution yet it will concur in the actions which will arise in the course of time. *Habuit se merum ut subjectum* when receiving its being, *sed non habebit se mere ut subjectum, imo concurret active*, it will not be merely subject but will actively concur from within in its actions when they happen.

2. I have never alleged the absolute decrees of the theologians, for I hold that there are no divine decrees which have not their grounds of choice although those grounds may be unknown to us. The majority of modern theologians may found the decrees on God's foreknowledge, but since the objects of that foreknowledge still depend on him, he must in the end have recourse to the choice of the best, making this choice from among all the possibles. This is independent of his foreknowledge of what will actually happen.

3. Even were I to suppose that ideas or perceptions arise in the soul at the moment they are produced as those who believe in occasional causes hold, I should not thereby destroy freedom. Why should this destroy freedom seeing that what is voluntary and free in our actions always depends on choice, although the *grounds* of this choice may have been prepared from all time, for these *grounds* are *inclinations* and not *necessitations?*

4. My bodily movements, those of my arm for example, are in my view necessary without it being in my power to change them. Where then is the freedom ? I reply, the freedom is in me not in the movements of my body. Yet however free I may be, God always knows what I shall choose and can make the body accord in advance of the volition. Tell me then wherein the impediment lies, whatever be your idea of freedom. You can if you will put down your pen. Who doubts it ? But God knows whether you will or not.

5. You say you are determined by the animal spirits in a way which you cannot avoid, so that were you able to see them working they would appear to you as the bullet from a cannon in whose path you might be. I reply : The animal spirits do not determine you; to see them do so would be to see the impossible. Your choice and judgment

determine you, and your judgment foreseen by God has made him determine beforehand that the animal spirits obey you when the time comes.

6. You ask me: Was this idea which I am now writing to you, yesterday enveloped in my soul without my knowing it? If yes, then there can be no freedom in a thing done. I reply: It is not a thing done but a thing to do. The future exists in the past no otherwise than by an inclination which is in the past to the production of the future.

7. You ask me finally, whether those animal spirits which are today the means of your writing were yesterday determined to do what they are doing today. Yes: They were determined to it but it is not they which make you write, although they are the means. You conclude that the two propositions "I think, therefore I am" and "I do what I will, therefore I am free" are equally evident. Yes, I heartily agree and would even add that I mean a freedom which is not only exempt from constraint but even from necessity.

[Leibniz cannot be said ever to have faced the real dilemma. He is right when he says that freedom depends on whether there is real choice quite irrespective of whether the choice made can

be foreknown. This avoids the real crux. The dilemma is that if there is real freedom there cannot be absolute foreknowledge in God, and if there is absolute foreknowledge in God there cannot be real freedom. He seems to affirm that God foreknows the unforeknowable, that is, the free choice of free spirits.]

IV
SUPPLEMENTARY ESSAYS

I

WHAT IS LIVING AND WHAT IS DEAD IN LEIBNIZ'S MONADOLOGY

1. LEIBNIZ'S METAPHYSICS AND NEWTON'S PHYSICS

Throughout the whole course of modern philosophy we find two divergent directions in which the attempt is made to interpret our knowledge of the physical universe. Broadly speaking, we may designate the first as the way of realism, the second as the way of idealism. They lead to alternative and antithetical conceptions of the nature of the existence of the physical world.

According to the way of realism, there is assumed or postulated an existential distinction between mind and world. Knowledge is the re lation between them, and in this relation the only thing distinctively mental is the act of knowing, the relation being between act of knowing and thing known. The activity in the act of knowing is affirmed to be purely an activity of direction. The attention is directed on an object and controlled, but the mind is purely passive in receiving revelation. The correlation of act and thing is affirmed to be complete. To the knowing act the independently existing reality is revealed. Realists insist on the simplicity and ultimate character of the knowing relation. It is sometimes

represented as the simple relation of togetherness.

The fatal defect of this attractive theory, and the method of direct investigation to which it invites the scientific researcher, is that it involves an initial assumption. It cannot start from existence—its own or another's; it cannot validate the truth of the relation (knowledge) which it affirms.

The second way of approaching the problem of the physical world is the way of idealism, using that term in its widest comprehension. The physical world is not assumed to be self-existent and self-revealing. The idealist starts with the active subject of experience in its immediate self-affirmation. To every apperceptive or self-conscious subject existence is given immediately in the exercise of its activity. Existence is not identical with consciousness, but it is identical with conscious activity. It is the *cogito ergo sum.* Every such active subject already possesses its external world in its own perceptions of its range of activity. This external world of its own perceptions becomes for each subject of experience a common world of general perception whenever there is intercourse between one subject and another, and the concept of a common world is the natural and necessary consequence of such intercourse. The idealist theory, therefore, is that the idea of a physical world independent

of each subject of experience and common to all is a function of intercourse and originates in the intercommunication of minds, and not *vice versa*.

I will now state the monadological theory in the form in which I am myself prepared to defend it. If the reals of the universe are monads, then there is no imaginable way in which two monads can perceive the same perceptions. By this I mean not only that the perceptions of an identical object are different for every individual observer of that object by reason of perspective, but that there is no imaginable way in which the different perspectives of individual observers can be identified by reference to an identical object. Every one of us may easily satisfy himself on this point by simple reflexion on experience. We only perceive our own perceptions and yet in our intercourse with one another we always refer our perceptions to a common world. This common world is not an independent universe acting on its own account. On the other hand, it is not illusion. The common world which is the subject matter of intercourse is an ideal construction, and it arises in a metaphysical necessity. We can test that it is so. The same argument applies to it as that which is accepted by everyone in regard to the real world of physics. Physics does not deal with sense qualities, but with mathematical coordinations. The object of

the physicist is the logical correlate of his measurements. The real world of physics is entirely ideal, not in the meaning that it is an arbitrary or fanciful construction, like the mythical and fictional æsthetic constructions of the poet ; it is the necessary outcome of the need to introduce order into experience. According to the monadological theory precisely the same is the genesis of the common world of discourse.

I do not say that this is explicit in the *Monadology* of Leibniz, but the principle is certainly there, and in my view there is no *philosophical* alternative. There is, however, the possible alternative of a *modus operandi* and this has always had a powerful attraction to the lay mind. The *modus operandi* is to obey Newton's warning to physics to beware metaphysics, to assume the truth and sufficiency of the data of common-sense experience, and to accept the common-sense objects and their setting or framework as the subject matter of physics. Along this line the great scientific advance has moved and up to a point with extraordinary success. It is only when the dispensing with metaphysics is seen to involve the setting up of metaphysics, when the principle *hypotheses non fingo* is itself seen to be an unconscious hypothesis, that the trouble comes. Newton's theory quite as much as Leibniz's is metaphysics.

2. WHAT IS VITAL IN THE MONADOLOGY

The fundamental principle of the monadology is that the real is essentially active, that the active is the living, and therefore that only living activities are true units.

The monadology sets forth a logically consistent theory of the composition or constitution of a universe in which every constituent is an active subject of experience living its own life and in living its own life subserving the universal life, the life of the universe.

The monadology rejects as self-contradiction and inconsistency the idea that dead, inert, material atoms or mass-units are or can be constituents of a universe. There is nothing dead, nothing purely inert in the universe. To be absolutely dead is not to be. The Democritean concept of the atoms and the void is rejected because mathematically the atom is not a unit, but divisible to infinity, and physically it is not simple. The reals are monads, simple substances, self-centred subjects of experience, whose activity consists in perception, and whose perceptions are the apprehension of the whole universe, limited in the degree of clearness or obscurity, because the monads are created and therefore finite, and qualified by their individual standpoints.

The idea of such a universe of individual reals is illustrated by Leibniz in the relation of the

mind to the body. Had he known the cell theory in its modern development, his illustration would have fitted the theme even more exactly. The mind in Leibniz's view is a simple substance, an indivisible unity which enters into compounds. The body is composite. Yet every part of the body lives its own individual life, and the whole mind-body organization is a harmony of individual living active subjects.

The profound significance of this theory when we apply it to physics is that the external universe of physical reality can only be represented as a phenomenon of intercourse. There can be no interaction of the monads in the mode in which the atoms of the materialist philosophy had been conceived to interact, because in its very conception the monad is self-centred, a subject not an object, viewing the universe only as it is mirrored to it in its perception. That is to say the activities of other monads are perceived by each monad, not as they are in themselves, but by each monad as the limitations of its own activity.

3. WHAT IS DEFECTIVE AND WHAT IS DEAD IN LEIBNIZ'S MONADOLOGY

Where Leibniz fails entirely is in any attempt to deduce the harmony of his system from the living principle, which is illustrated so excellently in the concept of the monad. There are monads

—this to Leibniz is immediate self-evident fact—but there is no way of conceiving their genesis, no way of understanding how they could have come into existence, except by creation. The harmony therefore, he concluded, could only be ascribed to the wisdom of the creator. It is true, indeed, that this did not present itself to him as a difficulty. It caused him no embarrassment. On the contrary, he regarded the appeal to the omniscience of God as the special merit of his system and probably it was the origin and basis of his whole conception. He reverts to it on every occasion and always refers to it as " my new system of the *pre-established* harmony ".

From the modern standpoint, and generally for us, this doctrine is not only entirely unconvincing, but it stamps the whole conception with the mark of artificiality. Even Leibniz himself had difficulty, for he hesitates between two quite irreconcilable concepts of God. At one time he conceives God as first cause and omniscient artificer, exercising his infinite wisdom in choosing the best possible universe from among all the possibilities present to his mind before creation, following out in anticipatory thought the consequences of the monadic activities to their infinitesimal limits ; at another time he conceives God as the Supreme Monad, *Monas monadum*, ruler and upholder of a world of free spirits.

4. THE SCIENTIFIC SIGNIFICANCE OF THE CONCEPTION OF THE MONADS

The atom of modern physics is neither the material space-occupant of the old philosophy nor the indivisible extensionless unit or simple substance of Leibniz ; it is an intellectual and purely mathematical construction. It cannot be presented to sense perception notwithstanding that it can only be represented in sensuous imagery, because by its very conception it is the condition and not the conditionate of sensuous imagery. It is mathematically deduced and metaphysically constructed in order to interpret, in the form of a working model, the causal scheme of spectroscopically revealed phenomena, that is, of the phenomena which accompany the scientific analysis of light. Moreover, the atoms of modern physics are not conceived as ultimate elements or constituents of the material world. They are not simple, but compound. They are systems of opposite forces in more or less stable equilibrium. For its ultimate, physics goes behind and beyond the atom to the field of force in which the atom is generated and to the unit electric charges into which it is finally resolved.

There are, however, two principles in modern science—not yet universally accepted principles, but each gaining continual confirmation from scientific research—which are in complete accord

with the essential doctrine of the monadology, and are also in definite disaccord and unreconcilability with the Newtonian metaphysical, or antimetaphysical, basis of physics. What is of peculiar significance to philosophy is that these two principles enable us to reform the monadology in a way which it never entered the mind of Leibniz to conceive. The two principles are: creative evolution in biology; relativity in physics. From the philosophical view-point the first is the more important; from the scientific view-point, the second.

(1) The principle of creative evolution enables us to correct the intellectualism of Leibniz. The active force, in whatever way we conceive it, which has created the forms of living organization, is not conceived anthropomorphically as a personal designer or artificer and it can not be represented as existing apart from the living forms in which its activity is finding expression. It is true that to a certain extent we have to construct our concept of the *élan vital* in much the same way as that in which the physicist constructs the atom, deducing the form and working of the model from the expression of it in actual sense perception. What, however, the principle of creative evolution recognizes and insists upon is that intellect is a product or outcome of organic evolution. Intellect is not a

privilege of enlightenment bestowed upon man either as a spiritual gift by a divine benefactor or as a chance endowment. It is the predominant mode of human activity, and the degree in which it supersedes other modes is characteristic of the species, but, like everything which evolution produces, it depends on selection and derives its efficiency from negation or deprivation, and it is tentative, destined it may be to be superseded. The human intellect, according to the principle of creative evolution, is not absolute ; it does not afford to man a vision or revelation of reality in its naked truth and disinterested existence. It is evolved for a practical end, it is relative to the range and action and vital needs of the human being. The principle of creative evolution enables us, therefore, to dismiss the divine artificer from Leibniz's scheme of the pre-established harmony and to replace it with a harmony immanent in the very concept of evolution itself.

(2) The second principle, the mathematical principle of relativity, introduces another and scientifically most important reform into the Leibnizian monadology. According to the monadology the activity of the monads consists in their perception alone, and their harmony consists in the different degrees of clearness or confusedness of their perceptions, ranging from the completely adequate perceptions of the

supreme monad to the almost total confusedness of the perceptions of the simple monad. The principle of relativity enables us to go behind this activity of perception, to rationalize it and see its ultimate ground. According to the principle of relativity, every subject of experience co-ordinates the universe—that is, the aggregate of events which constitutes nature—from an individual view-point. This view-point is that of an observer attached to a system of reference. This system of reference is, for the observer attached to it, at rest absolutely in regard to all other systems moving uniformly or non-uniformly in relation to it. The axes of co-ordination, three for space and one for time, which the observer in a system employs, are, therefore, always equal and invariable in whatever direction they are turned, although to observers in systems moving relatively to it they will vary to the exact extent necessary to compensate the relative movement. According to this principle therefore, the activity of the monads is not perception, if by perception we imply something absolute in the reality perceived. The primordial activity of the monads is not perceiving, but co-ordinating the universe. This co-ordinating the universe is a fundamental necessity of living activity. Action of any kind is clearly impossible in an uncoordinated universe. The

principle of relativity is formulated to meet the fact, empirically established, that there is no absolute system of reference, no system in terms of which all movements can be standardized, and consequently no objective universe in the accepted meaning. This is the counterpart, expressed in physical terms, of the metaphysical doctrine of the monadology.

5. IS THERE AN IMPASSE IN THE INITIAL CONCEPTION OF A MONADIC UNIVERSE?

Most philosophers who have given their attention to the theory of a monadic universe are deterred by a certain *non possumus* which seems to confront them in the initial presentation of the doctrine. On what conceivable principle, they ask, can " windowless ", non-interacting, monads be compounded? Have you not, they say, in characterizing your unit as a simple substance negated the inter-relatedness of the monads? Is not the monad by its definition a solipsistic activity ; how then, can it enter into and become a part of a community? If the argument I have advanced is accepted, the solution of the problem is anticipated. I admit the solipsistic character of the monad and I make no attempt to qualify it or to explain it away. What I insist on is that the interrelatedness of the monads is ideal ; that

intercourse is a purely ideal relation ; that ideal relations do not depend on interaction, are in no sense themselves interactions, and in fact are inconsistent with interaction. Interaction has a quite definite meaning, fixed, so far as the scientific use of the term is concerned, by Newton's third law of motion. Try, then, and imagine the monads interacting in obedience to such a law ; imagine them clashing and rebounding like the atoms of Epicurus, and see if out of such interaction you can generate the kind of relatedness implied in intercourse. Intersubjective intercourse belongs to a totally different set of ideas and refers to a totally different class of relations to those which are defined mechanistically in the laws of motion. Monadic activity is self-expression, and under no conditions can it be resolved into anything else. When, for example I speak and am understood, or hear and understand, the whole activity is within me. It is not the assault on my sense organs of sights and sounds, but the expression of my intuition in images and concepts which sets up within me an interrelatedness with other minds and is the basis of intercommunication. This activity is self-originated, self-directed, and self-included. All change in a monad is internal. The sensations—the words and visual signs which I externalize—are in their aspect of externality, abstractions,

schematic representations which I have devised for a practical purpose. It is I who spatialize and materialize them, not they which mould and transform me. They have no real status of their own, the work of externalization is mental and from within. It is intelligible that a subject of experience should externalize his consciousness. It is unintelligible that an alien and outside reality should generate an internal activity, and quite unmeaning when that activity is of the nature of intuition-expression.

II

THE IDEALISM OF THE MONADOLOGY

The Theory of Monads rests on the frank recognition of two facts. The first is that the knowledge which any individual subject of experience possesses is solipsistic. The second is that the relation between one mind and another is ideal and there is no real contact. The first fact was expressed by Leibniz in the dictum: "The monads have no windows by means of which anything can enter in or pass out". (*Monadology*, 7). The second was expressed by saying that monads exercise only an ideal influence on one another (*Monadology*, 51). It follows therefore that monads cannot interact and that they can intercommunicate. The crucial problem in monadology therefore is: how can there be intercourse or intercommunication of ideas between monads if knowledge is solipsistic and there is no interaction?

1. IS THE THEORY SELF-CONTRADICTORY?

The theory of monads, despite the attractiveness it possesses, is usually dismissed summarily on the ground that its two basal propositions are a self-contradiction, and moreover that this self-contradiction is itself two-fold. For first, if knowledge is solipsistic it seems impossible that

a monad can know there are other monads. Secondly, if interaction between monads is denied it appears a plain contradiction in terms to affirm that one monad can exercise an influence such as intercourse presupposes. The logical dilemma in each argument appears complete and yet as a matter of fact both arguments are and have always proved to be strengthless.

2. THE SENSE IN WHICH THE UNKNOWABILITY OF A THING MAY BE AFFIRMED

The first argument is practically identical with the objection which is continually raised against Kant's doctrine of the existence of an unknowable thing-in-itself. We cannot, it is said, affirm that a thing exists and also that it is unknowable, for if it is unknowable not even its existence is known ; nay, further, it is only possible to affirm unknowability of anything if we are already in possession of some knowledge about it, and therefore to affirm unknowability is to deny what we are affirming. Obvious as this argument is generally held to be, it is not effective. We feel that the contradiction can only be verbal for Kant's doctrine is intelligible, and it may be true. The answer to the objection is that self-knowledge, even in the extreme solipsistic meaning, contains within itself the implicit distinction between knowing a thing as it exists for the knower and

knowing a thing as it exists for itself. Even in ordinary common sense experience we make this distinction. We recognize that to know there are other minds is not to know other minds as they are in themselves, and we have no difficulty in reconciling our knowledge of the one with our conviction of the complete unknowability of the other. The argument is an empty logomachy.

3. IS EVERY RELATION A FORM OF INTERACTION OR DEPENDENT UPON AN INTERACTION?

The second objection is equally ineffective. It seems *prima facie* absurd to affirm that monads which by definition are reals, that is, things-in-themselves and not mind-dependent ideas, do not interact and yet nevertheless can enter into the relations with one another which intercourse implies. The reason simply is that we have come to regard all relatedness as being essentially a form of interaction. Interaction, however, has a quite unambiguous meaning. In physics it is the fundamental conception. It is defined by Newton's third law of motion. It is the concept which underlies the principle of conservation wherever there is physical action and reaction. It affirms a perfect equivalence or quantitative equality between every action and its consequent reaction. The principle was originally applied by Descartes to movement, which he held to be

constant in quantity and indestructible. Leibniz demonstrated the defect of this application and proved that it could only apply to what we conceive as force or energy, and the conservation of energy has since remained a fundamental principle of physics. In every transformation of energy from a latent form to a kinetic form or from a kinetic form to a latent form we postulate an exact equivalence. If we keep to this meaning of the term interaction it is obvious that the principle does not apply to psychical relations even by analogy. In the daily intercourse which is part of the routine activity of individual human beings there is no interaction so far as the interchange of ideas is concerned. Minds are not impoverished when they impart ideas, on the contrary they are, though in a special meaning of the term, enriched; and minds which receive ideas do not in the literal sense receive anything, for a mind can only have its own ideas and these must originate within it. There is then, in ordinary experience, a relation between individuals which is not interaction.

Though this is true, however, it by no means solves our problem or lightens our difficulty. If the exchange of ideas is not itself an interaction it seems to be conditioned by what is an interaction and to be wholly and necessarily bound to this condition. In order to have an interchange of ideas there must be speech, either articulated

or written, and speech is an interaction, not indeed between mind and mind, but between the organized sense-receptive bodies of the individuals, which bodies are continuous with and part of the physical world. If I would impart an idea to you it is true I do not pass something out of my mind leaving it poorer, and you do not receive into your mind an idea which is not your own idea, yet I can only effect this intercommunication by initiating a purely physical interaction between our bodies through the medium of the external universe to which the principle of conservation applies down to the minutest detail. This is the condition of intercourse and it seems to carry as its natural corollary that if we accept intercourse as fact we thereby postulate a world which is common to both of us and independent of each of us. Consequently, common-sense assumes, and seems abundantly justified in assuming, an external world, and physical science seems to find it necessary and essential to postulate a self-existing material universe in space and time, indifferent to the truth or error of our representations of it and of our thoughts about it. Were there no alternative the theory of monads would stand condemned by the force of plain fact. There is an alternative and the theory of monads is itself the alternative. The essential point in the theory is its denial of the assumption and its deliberate

rejection of the scientific postulate. The theory of monads is that the conception of a common universe is a consequence of monadic intercourse, and not its condition. It is from intercourse that the concept arises, out of intercourse that it takes shape, and not *vice versa*. The monads are not, as they are so often misrepresented, merely private perspectives. It is the monad which is private, not its outlook. The monad has no outlook. The monads are the reals and there is no universe except the universe which the monads themselves constitute. It is essential that the full significance of this aspect of monadology should be comprehended. It means that there is an alternative to the common-sense and scientific view that there must be a common universe, self-existent, as the pre-condition of mental activity. It is that the external world is an illusion which necessarily arises as a direct consequence of minds communicating. In the monadic theory, for example, space is for each monad the order of co-existences in its active perception, time the order of successions. There is no need to assume, nor reason to believe in, a space in itself or a time in itself or matter in itself, but if and when intercourse takes place between the monads the idea will naturally arise that the different orders of each monad to which each in its intercourse refers are one order common to all.

If the metaphysic of monadism is consistent and well-founded, then the postulate of an external world is otiose.

4. MONADOLOGY AS AN ALTERNATIVE TO MECHANISM

Monadology then is a metaphysic of reality. In challenging the common-sense view it claims to be itself consistent and self-contained in its integrality. It does not pretend to harmonize contradictions, what it does is to point to the contradictions of the common sense view as evidence that common sense is concerned with partial aspects of reality. The principle of individuality requires us to conceive the whole in its unity and this unity as indivisible. We may take an organism and disintegrate it, dissecting out what we may choose to consider its constituent parts, and represent these constituents as independent elements of which the whole is the aggregate, but in dividing the unity we lose the reality.

The alternative principle of monadology in regard to the genesis of the idea of an external universe is no longer a principle of philosophical idealism opposed to a principle of positive science. According to the principle of relativity the external world to which we refer in physics is not a discovery and is not a postulate and no scientific advantage is to be gained by assuming its

independent existence. We may even reject an absolute system of reference as both self-contradictory and as disproved by positive experiment. The principle of relativity is, to quote Einstein, " that the equations of physics must be covariant relatively to any pointer-reading transformations whatsoever of the spatio-temporal four-dimensional continuum." The mathematical demonstration of these covariant equations is the scientific triumph of the modern world.

5. LEIBNIZ'S REJECTION OF LOCKE'S THEORY OF THE ORIGIN OF IDEAS

I will now give what seems to me the direct answer to the question: How can there be intercourse if knowledge is solipsistic? Leibniz's own view is stated with particular clearness and with full emphasis in the beginning of his *Nouveaux Essais* (BOOK I., CHAP. I.). Philalethe, representing Locke in the dialogue, begins with a brief description of the general nature of Locke's argument in opposition to the doctrine of innate ideas and of his claim to have demonstrated the uselessness of that doctrine even as a hypothesis since man is able to acquire all the knowledge he possesses " without the aid of any innate impression." Théophile, representing Leibniz himself, replies: " You know, Philalethe, I have long been of the contrary opinion. I have always

held with Descartes, and I hold still, that the idea of God is innate, and that there are also other ideas which must be innate since they cannot be derived from the senses. Now, however, in accordance with my new system I go still further; and indeed I believe that all the thoughts and actions of our soul arise from an internal source within itself, without it being possible for its ideas to be given to it by the senses."

This last sentence expresses the fundamental concept of Leibniz's philosophy and it is essential to give it full weight in constructing the scheme of monadic intercourse. We have only to understand the nature of ideas in order to see at once the absurdity of imagining that they originate outside the mind and are mechanically conveyed into it by the avenue of the senses. (I use the term idea to include every form of mental existent—images and concepts, representations and thoughts). No doubt, Leibniz goes on to say in the same context, the senses do in a certain manner originate ideas by being the occasion of our perceiving, but ideas are not, like the " intelligible species " of the scholastics, cast off by external objects, nor are they a kind of impression on wax, or marks on a clean slate. They are forms which the mind itself, by reason of its active nature, imposes on its experience. They are innate in the sense that they depend on the

monad's activity, on the degree of clearness and distinctness in its perceptions, and on the final causes of its actions.

Such is Leibniz's view of the nature of ideas in conformity with his theory of monads. It is generally thought that when he added to the famous dictum *Nihil est in intellectu quod non prius in sensu fuerit* the qualifying words *nisi intellectus ipse* he was pointing out an exception. In fact he was completely altering its whole import. Modern biology and psychology have come to confirm Leibniz's doctrine and have given it an illustration and a meaning which it was impossible for him to foresee. He held indeed that every monad is qualitatively distinguished from every other, but for him the monadic activity consisted in perception alone, and as regards perception he could only conceive a difference in degree. Intellect appeared to him the exercise of a faculty of reason which in itself was absolute, a view implicit in all philosophical theories previous to the concept of organic evolution. It could never have occurred to Leibniz that intellect might be a product of biological evolution. For him intellect characterized the higher monads, the monads who are souls, and it took the form of apperception as distinct from pure perception, or as we may render it, self-consciousness as distinct from consciousness. It was by apperception that the

rational monad had the power to form the idea of other monads, for while mere manifoldness is given in the unity of pure perception, in apperception we experience and know the in-itselfness of existence. (*Monadology*, 16).

6. THE IN-ITSELF NATURE OF THE MONAD

The monad then is the concept of the individual philosophically defined in logically precise terms as an indivisible unit centre of activity, self-contained in its actions, expressing in its actions its own nature. To take an explicit example let us consider the individuality of a human being. A human being enters on its separate existence in the form which, as presented to our external perception, we term a fertilized ovum. Internally and in itself it is a heritage of instinctive tendencies and developing potencies. It will unfold and expand its inner force in response to and subject to favourable conditions of environment, yet its whole energy and its directing power are innate and self-contained. How then in fact does such a solipsistic individual come to recognize other individuals and inter-communicate with them? The usual answer is that it must arrive at this recognition by reasoning on its sense-experience. This is transparent nonsense. Recognition is the outcome of the individual's own power of self-expression and of the sympathetic or antipathetic

response it meets. This is the clue to the monadic scheme of intercourse. It can now be set forth in abstract terms.

The monad being conceived as activity must express itself in actions. Actions are innately determined but externally limited. The external limitations can only be perceived from within as self-limitations, but if the limitations are beyond control they will be conceived as alien forces. The limitations to the activity of a monad and the range they allow to its expression in actions give form and outline to the world. The world for the monad is the range of its activity. If now we conceive this activity as consisting in perception alone, the objects perceived will be the limitations or determinations of its actions reflected back to the perceiving centre. In the simple monad there is nothing more. Its activity is pure perception and it is self-contained and self-sufficient. But besides the simple monads there are the higher monads with greater powers. Some monads are entelechies or animal souls and some are rational souls. To the rational soul or apperceiving monad something more is possible, for apperception is self-consciousness and therefore knowledge of in-itselfness, and thus the rational soul, without transcending itself, without disruption of its essential unity, can recognize in-itselfness as pertaining to the

activities opposed to it. It is then self-consciousness which opens to the monad the possibility of knowing the existence of other monads. Leibniz indeed introduced at this point his famous theory of pre-established harmony. For us, in the light which modern science throws on the problem, it is entirely unnecessary. The monads are not juxtaposed in space, and therefore harmony and not interaction expresses the nature of their relations, but the harmony is not pre-established. It follows from the concept of the monads and the nature of their activity.

7. THE IMPLICATIONS OF APPERCEPTION OR SELF-CONSCIOUSNESS

The apperception or self-consciousness of a monad opens to it the possibility of knowing that other monads exist. Let us suppose the possibility realized and the knowledge attained. The crucial problem still remains. How is it possible for a monad to have intersubjective intercourse with another? The best approach to the problem is to consider how human individuals do actually hold intercourse. We communicate by speech. Speech is an acquirement conditioned by the development in the human organism of a complex neuro-muscular system of articulation, correlated with a sensory organ receptive of sound. Before such a contrivance can

have been constituted as a means of intercourse the individual must have been able himself to express to himself the meaning which speech is to convey to another. Speech or any device for intercourse presupposes therefore that the individuals who would communicate by means of it have already found expression for their intuitions. This is the cardinal point. Human speech is the outcome of man's artistic nature, of his power to use material to create forms into which to fix the expression of his intuitions. This artistic creation is the source and condition of intercourse. When a man makes use of a plastic material in order to express his artistic intuition, as when he fashions a stone into what for him is the semblance of a man there is nothing absolute in the material object or in the form impressed on it, the stone is simply employed *ad hoc* for an expression and a conveyance of meaning. The meaning it expresses to the artist who has fashioned it is conveyed to the man who beholds it only to the extent that the beholder has the creative artistic power to make it express his own intuition. It conveys no meaning to a bird or to a dog, nor has it even the power to deceive them by a semblance. The bird finds it a convenient resting-place, quite undisturbed by the human form into which the artist has fashioned it. Another human being interprets it, not on account of anything absolute in the

form or in the material but because his mentality is attuned to the artist's mentality and solely to the extent to which it is attuned. Human beings, in short, are able to be responsive to the expressions of one another because they are organized on the same type, confined to the same range of action and identical in their life interests.

The reception of a communication, then, supposes in the receiver a process of artistic creation which originates within him, and the conditions of intercourse are, first that the intercommunicating minds are by their inner nature already attuned to one another, and second that each communicating mind acts creatively for itself. In ordinary human intercourse there is no interaction. If a man has an experience to which he cannot find means of giving outward expression, he cannot communicate it ; and if he can express his intuition in image or concept and convey it by speech it is only on condition that his self-expression evokes responsive self-expression in the mind which receives it.

8. WHY THE POSTULATE OF AN INDEPENDENT MATERIAL WORLD IS USELESS

Why, it may be asked, should we elaborate a theory of human intercourse when by accepting one simple condition the fact is sufficiently

intelligible? We have only, it will be said, to assume the presence of two minds in a universe the laws of which condition both, and this universe will afford them a common ground of reference. Where but from such a universe does an artist obtain his plastic material in which he fixes the expression of his intuition, be his material a pigment, or a tone, or a solid resisting stuff? The reply is that the existence of such a universe and the presence of monads within it, even if it be fact, is irrelevant. It would present us with a new problem but in no way assist us to solve our present one. Let us suppose that there is an external world common to the monads and existing independently of them and of their activity of perception, how will it explain intercourse unless we already know the means by which it would or could reveal itself to the monads and itself produce to them the evidence of its independent existence beneath the varied appearances it must present to them? The only question about the hypothesis of an external world which is relevant is whether, seeing that it is impossible we can know by direct evidence that such a world exists, it is necessary in the interests of practical life, or advantageous to physical science, to assume it. To this question monadology is itself the clear and unambiguous answer that the assumption is unnecessary and the

postulate useless. If intercourse between monads is fact, then the whole genesis of the concept of a common universe is revealed. If there is an intersubjective intercourse, nothing more is necessary to account for the genesis of the idea of a common world for such an idea must be its immediate consequence. The existence of a common world as the cause of intercourse is unintelligible, just because knowledge of such existence could only arise as an effect of intercourse. The idea of an external world could not arise naturally and spontaneously in a mind cut off from intersubjective intercourse.

Monadology is a rational doctrine from beginning to end just because it works without postulates, and is able to reject assumptions. There is no *lacuna* in its scheme, no stage in its theory which requires a leap in the dark, an appeal to faith, an exhortation to piety, natural or supernatural. It starts with the Cartesian *Cogito*, the immediate identity of consciousness and existence. It shews us that all our ideas, not only the ideas of self and of God and mathematical relations, but all the imagery of sense and all the concepts of the understanding are within us, our own inalienable possession. It shews how in self-consciousness we are given the clue to the interpretation of the nature of reality. To exist is to be active. Pure passivity, absolute

inertia, are limits. There is nothing positive in matter conceived as pure inertia, it is non-existence. To do nothing is to be nothing. Yet the limitations to our activity are felt to be real and if they are real they are active and must exist in themselves. There are, then, other monads and we conceive their in-itself nature on the analogy of our own. The sympathetic or antipathetic responses we receive from these monads enable intersubjective intercourse to be effective to the extent to which the responding activities are attuned to our own. From intersubjective intercourse arises the concept of the physical world of our daily routine experience.

9. PHILOSOPHY AND COMMON SENSE

Is then the external world of common-sense an illusion and are we called upon to disown it and abandon it? It is an illusion in the same sense in which we now believe the stationary earth and moving firmament are illusions. The monadic theory in giving us insight does not change our nature. We may reckon the common sense world as part of our humanity and we need not do violence to our common sense view. We are not expected to stand on our heads because optical science can prove that visual images are reversed on the retina. "Les Copernicians," said Leibniz "parlent avec les autres hommes du mouvement du

soleil." On the other hand, science has everything to gain by a consistent metaphysical theory. The materialism of Epicurus and Lucretius, the Scholasticism of St. Thomas, the scientific realism of Newton and Locke were well enough when science meant little more than astronomy and mechanics. Materialism fails completely in biology and in psychology, and we are coming to see that the reason of its failure is that the sciences of life and mind introduce us to a realm of reality profounder and more elemental than that which we study in physics.

10. MONADOLOGY A REALISM WHICH IS THE ANTITHESIS OF MATERIALISM

We are bound to admit however that from the metaphysical standpoint monadology labours under a peculiar difficulty, one which has presented itself at many times and in diverse forms in the history of philosophy. Our only view of the universe is from within. We can never attain the position we are always striving for as a scientific ideal, the vantage point from which we can survey reality with a disinterested and dissociated contemplation. What we distinguish as external to us is not external in any but a purely relative meaning. We have absolutely nothing but our own consciousness of our own activity, self-centred and self-contained, from which and

with which to construct our representation of the universe. It seems to us indeed that the reality, the ocean of being which surrounds us, must transcend our finite experience, and yet all we can do is to frame our idea of infinity on this solipsistic foundation. Monadology faces this difficulty, frankly and fearlessly, and instead of recoiling appalled by it, or devising expedients to circumvent it, accepts it. The theory of monads is a realism in the true meaning of the term. The monads are reals in the same meaning in which the atoms of Democritus were reals. The monads are not ideal in the sense that their existence is mind-dependent. They are things-in-themselves. At the same time monadology is the antithesis of materialism. The universe of monadology is a living thing and its constituent elements are living things. There is nothing dead, no substratum of lifeless, mindless stuff. The monads though self-contained enter into compounds. The Cartesians conceived the world as a vast machine which had been set in motion, its large wheels interlinked with and receiving movement from its small wheels, the whole being self-contained. Leibniz conceived the world as a living individual every part of which was also an individual, living its own life and subserving by its activity the organic life of the whole.

III

LEIBNIZ AND SPINOZA

Spinoza died in 1677, Leibniz in 1716, a difference of thirty-nine years. The dates are important, for Leibniz's philosophical writings, those in which his system appears complete and not as a tentative sketch, were composed in the last fifteen years of his life, that is, more than twenty years after Spinoza's death and the posthumous publication of the Ethics.

In 1676, the year before Spinoza's death, Leibniz travelling home to Hanover from Paris by way of London and Amsterdam, paid a visit to Spinoza, was shewn by him the unpublished manuscript of the Ethics and carried away with him some extracts from it. Out of this simple and quite ordinary incident a monstrous fabrication of calumny has been constructed. The detractors of Leibniz suggest that the main metaphysical ideas of his philosophy were borrowed from Spinoza without acknowledgment and that the injustice was concealed by Leibniz's feigned indignation at the blasphemous conclusions laid to Spinoza's charge, a charge from which Leibniz was honourably bound to exonerate him. It is unlikely that any significance in the visit whatever would have been suggested if we had

only the simple accounts of it preserved in the correspondence. It happened however that the closing years of Leibniz's life were embittered by the charge of plagiarism in regard to the discovery of the infinitesimal calculus which had been levelled against him by the followers of Newton, and evidently, to his distress, believed by Newton himself. This serious controversy led the opponents of Leibniz to make capital of the innuendo that Leibniz's philosophical ideas as well as his mathematical inventions were purloined. In support of the attack on Leibniz's intellectual honesty there is usually set forth a comparison of the two systems of Spinoza and Leibniz, to the disparagement of Leibniz, at least insofar as originality is concerned. Then in the absence of any reference to Spinoza by Leibniz the suspicion of deliberate negligence or even jealousy is insinuated, and the few occasions in which Leibniz gives expression to his rejection or abhorrence of Spinoza's conclusions are cited as instances of his hypocrisy. The whole monstrous edifice is an absurd calumny and ought to be finally swept into limbo, leaving no need even for an apologist.

Apart from the fact that the plagiarism, if there was plagiarism, must have been plagiarism of a work which for twenty years had been celebrated in the intellectual world, the absurdity of the whole

story is the fact that there is nothing in Spinoza's *Ethics* for anyone to plagiarize. Those who think there is, instead of doing honour to the great genius of Spinoza, simply fail to perceive wherein the strength and value of his work lies. Of all the philosophers of the modern period no greater genius than Spinoza has exercised a greater influence than he did, but this is not due to the originality of his concepts, it is due to the force of his reasoning and to the beauty of his ethical ideal. It is impossible to point to any idea of Spinoza's which has enriched the world by the introduction of a new concept in the same sense in which, let us say, Kant's concept of the *a priori* synthesis and Hegel's concept of the dialectical nature of thought were new ideas. Spinoza does not stand in the history of philosophy for a new departure in metaphysics, or for a new enfranchisement in method, or even for a new principle in ethics. And yet no greater force has ever found expression in the intellectual world than that which is summed up in his philosophy. The reason is not far to seek. Spinoza's genius was in his absolute confidence in human reason and in his fearless defence of logical consistency. It was not the pantheism of the *Ethics* but the critical analysis of the Scriptures in the *Tractatus theologico-politicus* (what today we should call modernism) which brought on

him the execrations of anathematizing theologians of widely different cults. So far as his fundamental metaphysical concepts are concerned, they are simply and purely Cartesian. He does indeed depart from Descartes on important points, for example, on the seat of the soul in the pineal gland, and he does not follow him in the view that animals are automata devoid of feeling and thought. His concept of one substance existing in infinite modes is indeed a great advance on the Cartesian doctrine of two substances each distinguished by an essential attribute—yet it is simply a logical advance. The fundamental distinctions of Descartes all find their place in the system of Spinoza. He rejects final causes, not on the ordinary deterministic arguments, but because they are inconsistent with the concept of the one infinite substance. There can be no final cause of God, and if for God final cause does not exist, it cannot be derived from God. "Deus ex solis suæ naturæ legibus, et a nemine coactus agit—demonstravimus, nihil sine Deo esse nec concipi posse, sed omnia in Deo esse, quare nihil extra ipsum potest, a quo ad agendum determinetur vel cogatur." (*Ethica*, PT. I., 17) The determining cause of everything is to be found in God, not however in God's will but in God's nature, in the same sense as the determining cause of the equality of the three angles of the

triangle to two right angles is in the nature of the triangle.

This doctrine of causality as immanent and not transient was implicit in Descartes's fundamental concept, the concept of substance as the substratum in which the qualities inhere, although neither Descartes himself nor his followers with the one exception of Spinoza understood it. Spinoza alone realized it in its full comprehension and accepted it. It was in complete accord with the direction of his speculation, with the intuition of his nature, and with his practical ethical principle. He draws out its full consequences, which amount in short to the complete rejection of all interpretation of Nature and Mind by final causes and the denunciation of final causes as mere sense deception.

The genius of Leibniz, confronted with the same position, follows an entirely different direction. Freedom, purpose, final end, responsibility, individuality, personality, for him are facts. If they are inconsistent with the concept of substance and contradict its definition, then it is the concept of substance which calls for re-formation and new definition. He realizes with all the force of Spinoza that the static concept of substance makes creation impossible, negates the idea of it. Accordingly he rejects the static concept of substance. He reforms the whole notion. It is not

movement but force which we are to regard as indestructible. This was a new idea. Substance is activity. It is not an inert substratum in which attributes inhere, to which qualities are attached. The idea of substance is replaced by the idea of subject. A thing is what it does. Substance is not necessarily one, it is many, for every subject of experience expressing its nature in outward action is a substance. It is in this new concept that the contrast appears between the modes of Spinoza and the monads of Leibniz. So far from expressing the same thought in different ways, it is the same fact interpreted in directly opposite ways.

Spinoza's determinism is not mechanism in the modern scientific meaning and Leibniz's libertarianism is not finalism in the ordinary teleogical meaning. Both philosophers interpret causality as the expression in outward action or in movement of an inherent nature. Yet the difference is profound and the opposition complete. It turns on the principle of individuality. We are far even today from a final and satisfactory solution. So far as ordinary opinion is concerned, common sense, always shallow and superficial, contents itself with a compromise. Rigid theoretical necessity in the laboratory ; purpose, responsibility and freedom in the practical sphere; seem easily reconcilable, and hence the profound

difference between the two principles, Spinoza's and Leibniz's, usually passes unnoticed.

In many respects Spinoza's principle appears the more satisfactory. It follows the general trend of rational speculation and it seems to accord with the intellectual bias of the human mind. Individuality appears to Spinoza as the time aspect of an eternal being. The modes are the transient forms which the unchanging reality assumes to the onlooker. Like the waves of the sea they present an aspect of ceaseless change and yet they are no more than the momentary forms of the changeless ocean. There can be no real individuality if individuality means dividing the substance. Leibniz on the other hand approaches the problem from a different angle. Suppose, he puts the question to himself, that God, infinite in knowledge and power, wills to create free spirits, what are the conditions of the possibility of such a creation? The answer is the system of the pre-established harmony. From it follows a new concept of God, a new concept of man, and a new concept of man's relation to God. God may now be conceived under the category of personality. He becomes the ruler of free spirits. We have a philosophy of freedom, of creation, of invention.

In the history of philosophy Spinoza and Leibniz appear together. They differ pro-

foundly. One is a continuator, the other an innovator. One carries to its completion the great principle which Descartes had inaugurated, the other anticipates the great revolution which is to be achieved by Kant.

Index

Anselm, St., 155
Apperception, 47 *ff.*, 197
Appetition, 51, 52
Aristotle, 56
Arnauld, Antoine, 6, 36, 43
Barbarus, Hermolaus, 86 *ff.*
Bayle, Pierre, 6, 7, 9 *ff.*, 53, 102
Berkeley, 65, 95
Births and Deaths, 123 *ff.*
Clarke, 6, 44
Composites, 30
Compossibles, 93
Confused Perceptions, 59
Contradiction, Principle of, 18, 70
Creative Evolution, 179
Descartes, 52, 73, 83, 122, 131
Discourse on Metaphysics, 36, 40
Empirics, 151
Entelechies, 23, 56, 110, 111, 117 *ff.*
Eugene of Savoy, Prince, 3
Force, 20, 157
Freewill, 163 *ff.*
Harmony, Pre-established, 21
Hippocrates, 105
Hobbes, 154
Hume, 73
Huyghens, 146, 147
Imagination, 67
Immortality, 50
Interaction, 187 *ff.*
Intercourse, 176, 185
Jacquelot, Isaac, 153
Kant, 32, 78
Locke, 6, 65, 74, 83
Malbranche, 95, 128
Malpighi, 12
Materialism, 203 *ff.*
Mechanism, 55, 191.
Memory, 58
Mersenne, 84
Metamorphosis, 13, 23
Metempsychosis, 13
Nature and Grace, Principles of, 3, 7
Newton, 83, 174
Nouveaux Essais, 51, 192
Pascal, 79
Paul, St., 60
Perception, 22, 47 *ff.*
Phenomenon bene fundatum, 19
Plato, 145
Plenum, 107
Plotinus, 145
Poiret, 83, 85
Preformation, 12, 124
Relativity, Principle of, 180
Remond, Nicolas, 145, 148
Representation, 63
Rorarius, 11, 53
Sensible Species, 42
Sophia, Electress, 51
Spermatic Animals, 125
Spinoza, 28, 78, 83, 91, 108, 205 *ff.*
Substance, 27
Sufficient Reason, Principle of, 18, 71
Swammerdam, 12
Tabula rasa, 65
Tarquinius Superbus, 139
Theodicy, 6, 46, 62, 76, 80, 139
Voltaire, 10
Windows, 39

Printed in Great Britain at

THE FAVIL PRESS

152 *Church Street, Kensington, London, W.*8

First Printing: 1930

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89388

UNIVERSITY OF TEXAS AT TYLER
B2580.E5 1930
The monadology of Leibniz,
0 00 01 0016413 6

893

B 2580 E5 1930
Leibniz, Gottfried W.
The monadology of Leibniz, with an introduction.